

GEOLOGICAL SURVEY CIRCULAR 749-C



Earthquakes in the United States, July–September 1975

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By C. W. Stover, R. B. Simon, W. J. Person,
and J. H. Minsch

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United States Department of the Interior

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Geological Survey

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INTRODUCTION

The earthquake information in this publication supplements that published in the NEIS (National Earthquake Information Service) publications, PDE ("Preliminary Determination of Epicenters") and "Preliminary Determination of Epicenters, Monthly Listing," to the extent of providing detailed felt and intensity data, as well as isoseismal maps for U.S. earthquakes. The purpose is to provide a complete listing of macroseismic effects of earthquakes, which can be used in risk studies, nuclear power plant site evaluations, seismicity studies, and answering inquiries by the public.

This publication contains two major sections. The first (table 1) is a tabular listing of earthquakes in chronological order by State, consisting of the following basic information: date, origin time, hypocenter, magnitude, maximum intensity, and computational source of the hypocenter. The second section consists of five maps and table 2, which lists detailed intensity information. The list of earthquakes in table 1 was compiled from those located in the United States or off the coasts that were published in the PDE; from hypocenters in California above magnitude 3.0, supplied by California Institute of Technology, Pasadena, and the University of California, Berkeley; from hypocenters in Hawaii supplied by the Hawaiian Volcano Observatory; and from any others that were felt or that caused damage, regardless of magnitude or availability of a hypocenter. Known or suspected explosions are also listed.

The intensities and macroseismic data were compiled from information obtained through questionnaires, from newspaper articles, and with the cooperation of other government agencies, State institutions, local organizations, and individuals. (See "Acknowledgments" for a list of collaborators.) The questionnaire (fig. 1A, B) is the latest revision of this form; it was not in use for earthquake-intensity evaluations for the years 1975-76. An interim version of the form and an earlier version that had been in use since the 1930's were the basis for intensity evaluations throughout 1975. Anyone wishing to submit felt or damage information on earthquakes for inclusion in future reports should send it to the National

Earthquake Information Service, Stop 967, Box 25046, Denver Federal Center, Denver, Colo. 80225. Copies of the current "Earthquake Report" questionnaire can be obtained at this address.

The primary method used by the NEIS to collect macroseismic information is a questionnaire canvass using the "Earthquake Report" forms, which are mailed to postmasters in the area affected by the earthquake. The postmasters complete the forms and return them to the NEIS, where they are evaluated and an intensity value is assigned. The intensity observations are mapped and contoured by isoseismals. Isoseismal contours present a generalization of intensity data and an extrapolation of these data to regions from which there are no observations; they do not necessarily account for every individual observation.

The data in table 2 will be included in the "Earthquake Description" section of "United States Earthquakes," an annual publication, to which later data from other sources may be added for the purpose of updating and completeness. "United States Earthquakes" is published jointly by the U.S. Geological Survey, Department of the Interior, and the Environmental Data Service, NOAA, Department of Commerce.

DISCUSSION OF TABLES

The parameters for the earthquakes in table 1 and table 2 include the date, origin time, hypocenter (epicenter and focal depth), magnitude, intensity, and hypocenter source. The origin time and date are listed in Universal Coordinated Time (UTC) and local standard time based on the time-zone maps in figures 2 and 3. The epicenters, which were taken from those published in the PDE, or from other sources as noted, are listed here to two decimals. The accuracy of the epicenters is that claimed by the institution supplying the hypocenter and is not necessarily the accuracy indicated by the number of decimals listed. The epicenters located by the NEIS have a varying degree of accuracy, usually two-tenths of a degree or less, depending on their continental or oceanic location. The oceanic hypocenters are less accurate than those on the continent, even

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
EARTHQUAKE REPORT

Form Approved
OMB No. 42-R1700

Please answer this questionnaire carefully and return as soon as possible.

1. Was an earthquake felt by anyone in your town or zip code area recently?

☐ Not felt: Please refold and tape for return mail.

☐ Felt: Date _____ Time _____

☐ AM ☐ Standard time
☐ PM ☐ Daylight time

Name of person filling out form _____

Address _____

City _____ County _____

State _____ Zip code _____

If you felt the earthquake, complete the following section. If others felt the earthquake but you did not, skip the personal report and complete the community report.

PERSONAL REPORT

2a. Did you personally feel the earthquake? 1 ☐ Yes ☐ No

b. Were you awakened by the earthquake? 2 ☐ Yes ☐ No

c. Were you frightened by the earthquake? 3 ☐ Yes ☐ No

d. Were you at 4 ☐ Home 5 ☐ Work 6 ☐ Other?

e. Town and zip code of your location at time of earthquake _____

f. Check your activity when the earthquake occurred:

7 ☐ Walking 8 ☐ Sleeping 9 ☐ Lying down 10 ☐ Standing

11 ☐ Driving (car in motion) 12 ☐ Sitting 13 ☐ Other

g. Were you 14 ☐ Inside or 15 ☐ Outside?

h. If inside, on what floor were you? 16 ☐

Continue on to next section which should include personal as well as reported observations.

COMMUNITY REPORT

Check one box for each question that is applicable.

3a. The earthquake was felt by ☐ No one 17 ☐ Few 18 ☐ Several 19 ☐ Many 20 ☐ All?

b. This earthquake awakened ☐ No one 21 ☐ Few 22 ☐ Several 23 ☐ Many 24 ☐ All?

c. This earthquake frightened ☐ No one 25 ☐ Few 26 ☐ Several 27 ☐ Many 28 ☐ All?

4. What outdoor physical effects were noted in your community?

Parapets or cornices fallen 29 ☐ Yes ☐ No

Trees and bushes shaken 30 ☐ Slightly 31 ☐ Moderately 32 ☐ Strongly

Standing vehicles rocked 33 ☐ Slightly 34 ☐ Moderately 35 ☐ Strongly

Moving vehicles rocked 36 ☐ Slightly 37 ☐ Moderately 38 ☐ Strongly

Ground cracks 39 ☐ Wet ground 40 ☐ Steep slopes 41 ☐ Dry and level ground

Landslides 42 ☐ Small 43 ☐ Large

Underground pipes 44 ☐ Broken 45 ☐ Out of service

Water splashed onto sides of lakes, ponds, swimming pools 46 ☐ Yes ☐ No

Elevated water tanks 47 ☐ Cracked 48 ☐ Twisted 49 ☐ Fallen (thrown down)

Air coolers 50 ☐ Displaced 51 ☐ Rotated 52 ☐ Fallen

Railroad tracks bent 53 ☐ Slightly 54 ☐ Greatly 57 ☐ Destroyed

Stone or brick fences 55 ☐ Cracked 56 ☐ Fallen 60 ☐ Rotated

Tombstones 58 ☐ Displaced 59 ☐ Cracked 61 ☐ Fallen

Chimneys 62 ☐ Cracked 63 ☐ Twisted 64 ☐ Fallen

65 ☐ Broken at roof line 66 ☐ Bricks fallen

Highways or streets 67 ☐ Cracked slightly 68 ☐ Large cracks 69 ☐ Displaced

Sidewalks 70 ☐ Cracked slightly 71 ☐ Large cracks 72 ☐ Displaced

Continued on the reverse side

FIGURE 1.--Example of the "Earthquake Report" form used for evaluating the intensities of earthquakes.
A, front side.

5. What indoor physical effects were noted in your community?

Windows, doors, dishes rattled	73 <input type="checkbox"/> Yes	<input type="checkbox"/> No
Buildings creaked	74 <input type="checkbox"/> Yes	<input type="checkbox"/> No
Building trembled (shook)	75 <input type="checkbox"/> Yes	<input type="checkbox"/> No
Hanging pictures	76 <input type="checkbox"/> Swung	77 <input type="checkbox"/> Out of place
Water in small containers	79 <input type="checkbox"/> Spilled	80 <input type="checkbox"/> Slightly disturbed
Windows	81 <input type="checkbox"/> Few cracked	82 <input type="checkbox"/> Some broken
		83 <input type="checkbox"/> Many broken

6a. Did hanging objects, doors swing? ☐ No

b. Can you estimate direction? ☐ No

84 <input type="checkbox"/> Slightly	85 <input type="checkbox"/> Moderately
86 <input type="checkbox"/> Violently	
87 <input type="checkbox"/> North/South	88 <input type="checkbox"/> East/West
89 <input type="checkbox"/> Other	

7a. Were small objects (dishes, knick-knacks, pictures) ☐ Unmoved

b. Was light furniture ☐ Unmoved

c. Were heavy furniture or appliances ☐ Unmoved

91 <input type="checkbox"/> Overturned	92 <input type="checkbox"/> Fallen, not broken	90 <input type="checkbox"/> Shifted	93 <input type="checkbox"/> Broken?
94 <input type="checkbox"/> Shifted	96 <input type="checkbox"/> Fallen, not broken	97 <input type="checkbox"/> Broken?	
95 <input type="checkbox"/> Overturned		98 <input type="checkbox"/> Overturned	100 <input type="checkbox"/> Broken?
99 <input type="checkbox"/> Shifted			

B. Indicate effects of the following types to interior walls if any:

Plaster	101 <input type="checkbox"/> Cracked	102 <input type="checkbox"/> Fell
Dry wall	103 <input type="checkbox"/> Cracked	104 <input type="checkbox"/> Fell
Ceiling tiles	105 <input type="checkbox"/> Cracked	106 <input type="checkbox"/> Fell

9a. Check below any damage to buildings or structures.

Foundation	107 <input type="checkbox"/> Cracked	108 <input type="checkbox"/> Destroyed
Interior walls	109 <input type="checkbox"/> Split	110 <input type="checkbox"/> Fallen
Exterior walls	112 <input type="checkbox"/> Hairline cracks	113 <input type="checkbox"/> Large cracks
	115 <input type="checkbox"/> Partial collapse	116 <input type="checkbox"/> Total collapse
Building	117 <input type="checkbox"/> Moved on foundation	118 <input type="checkbox"/> Shifted off foundation
		111 <input type="checkbox"/> Separated from ceiling or floor
		114 <input type="checkbox"/> Bulged outward

b. What type of construction was the building that showed this damage?

119 <input type="checkbox"/> Wood	120 <input type="checkbox"/> Stone	121 <input type="checkbox"/> Brick veneer	122 <input type="checkbox"/> Other
123 <input type="checkbox"/> Brick	124 <input type="checkbox"/> Cinderblock	125 <input type="checkbox"/> Reinforced concrete	

c. What was the type of ground under the building?

126 <input type="checkbox"/> Don't know	127 <input type="checkbox"/> Sandy soil	128 <input type="checkbox"/> Marshy	129 <input type="checkbox"/> Fill
130 <input type="checkbox"/> Hard rock	131 <input type="checkbox"/> Clay soil	132 <input type="checkbox"/> Sandstone, limestone, shale	

d. Was the ground: 133 ☐ Level 134 ☐ Sloping 135 ☐ Steep?

e. Check the approximate age of the building:

136 <input type="checkbox"/> Built before 1935	137 <input type="checkbox"/> Built 1935-65	138 <input type="checkbox"/> Built after 1965
--	--	---

10a. What percentage of buildings were damaged?

Within 2 city blocks of your location ☐ None

b. In area covered by your zip code ☐ None

139 <input type="checkbox"/> Few (about 5%)	140 <input type="checkbox"/> Many (about 50%)	141 <input type="checkbox"/> Most (about 75%)
142 <input type="checkbox"/> Few (about 5%)	143 <input type="checkbox"/> Many (about 50%)	144 <input type="checkbox"/> Most (about 75%)

11a. Were springs or well water disturbed? 145 ☐ Level changed 146 ☐ Flow disturbed

b. Were rivers or lakes changed? 147 ☐ Muddied 148 ☐ Yes ☐ No ☐ Don't know

12a. Was there earth noise? ☐ No 149 ☐ Faint 150 ☐ Moderate 151 ☐ Loud

b. Direction of noise 152 ☐ North 153 ☐ South 154 ☐ East 155 ☐ West

c. Estimated duration of shaking 156 ☐ Sudden, sharp (less than 10 secs) 157 ☐ Long (30-60 secs)

158 ☐ Short (10-30 secs) 159 ☐ Other

13. What is the approximate population of your city/town? Or are you in a

160 <input type="checkbox"/> Less than 1,000	161 <input type="checkbox"/> 10,000 to 100,000	164 <input type="checkbox"/> Rural area?
162 <input type="checkbox"/> 1,000 to 10,000	163 <input type="checkbox"/> Over 100,000	

This community report is associated with what town or zip code? _____

Thank you for your time and information. Refold this card and tape for return mail.

FIGURE 1.--Example of the "Earthquake Report" form used for evaluating the intensities of earthquakes.
B, reverse side.

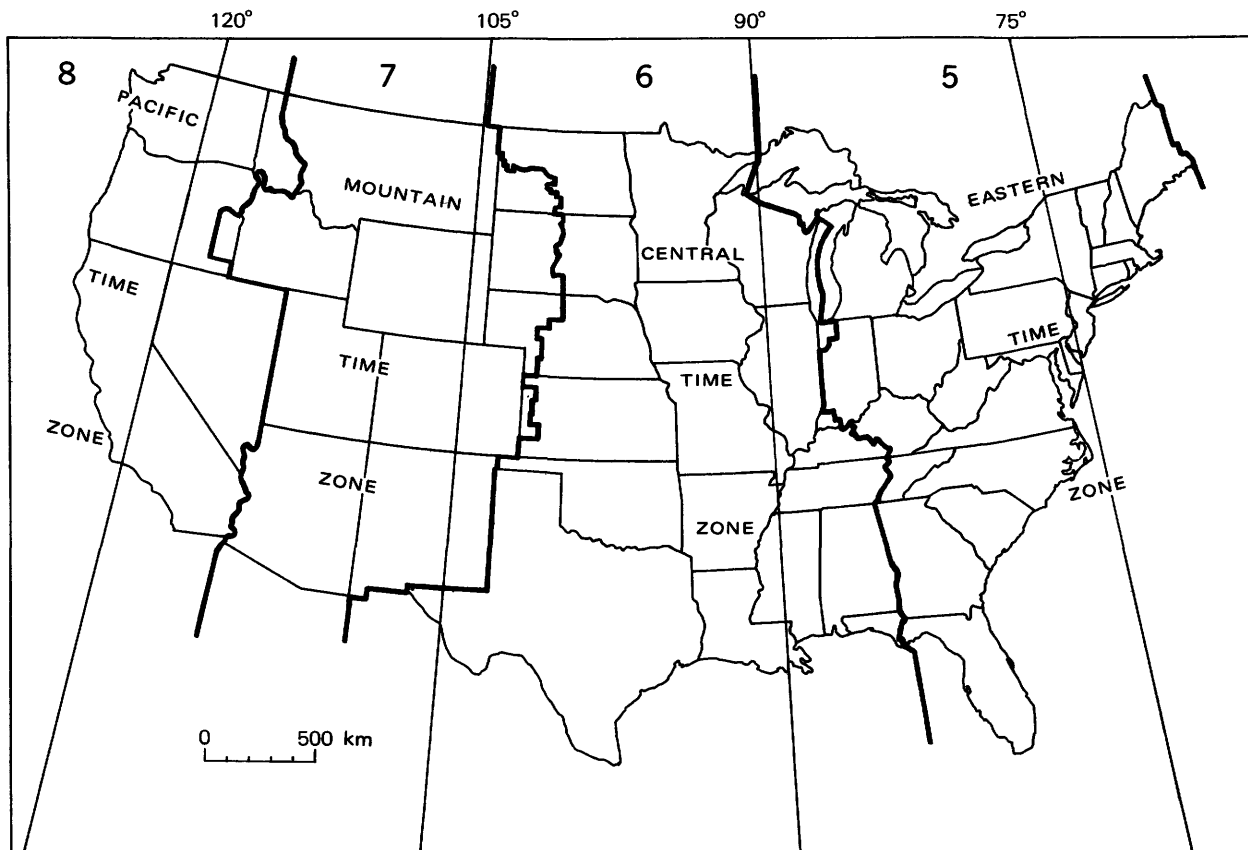


FIGURE 2.--Standard time zones of the conterminous United States. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

though both are listed to two decimals. Depths are listed to the nearest whole kilometer.

Figures 4-6 are maps summarizing the earthquake activity for the conterminous United States, Alaska, and Hawaii for the periods July-September 1975. The magnitudes plotted in these figures are based on ML or mBLg; if neither was computed, then on MS; and finally on mb, when it was the only magnitude computed.

The magnitude values listed in tables 1 and 2 were furnished by cooperating institutions or determined by the NEIS. The computational sources are labeled according to the assigned letter codes shown in headnotes to tables 1 and 2; the letter follows the value listed under the column heading "Magnitude." In table 1 the absence of a letter code indicates that the NEIS is the source. In table 2 the magnitude source is the same as the location source unless indicated otherwise, by an alphabetic character to the right of the magnitude value. The magnitude values calculated by the NEIS are based on the following formulas:

$$MS = \log(A/T) + 1.66 \log D + 3.3, \quad (1)$$

as adopted by the International Association of Seismology and Physics of the Earth's Interior (IASPEI; Bath, 1966, p. 153), where A is the maximum horizontal surface-wave ground amplitude, in micrometers; T is the period, in seconds, and $18 \leq T \leq 22$; and D is the distance, in geocentric degrees (station to epicenter), and $20^\circ \leq D \leq 160^\circ$. No depth correction is made for depths less than 50 km.

$$mb = \log(A/T) + Q(D, h), \quad (2)$$

as defined by Gutenberg and Richter (1956), except that T, the period in seconds, is restricted to $0.1 \leq T \leq 3.0$, and A, the ground amplitude in micrometers, is not necessarily the maximum of the P-wave group. Q is a function of distance D and depth h, where $D \geq 5^\circ$.

$$ML = \log A - \log A_0, \quad (3)$$

as defined by Richter (1958, p. 340), where A is the maximum trace amplitude in millimeters, written by a Wood-Anderson torsion seismometer, and $\log A_0$ is a standard value as a function of

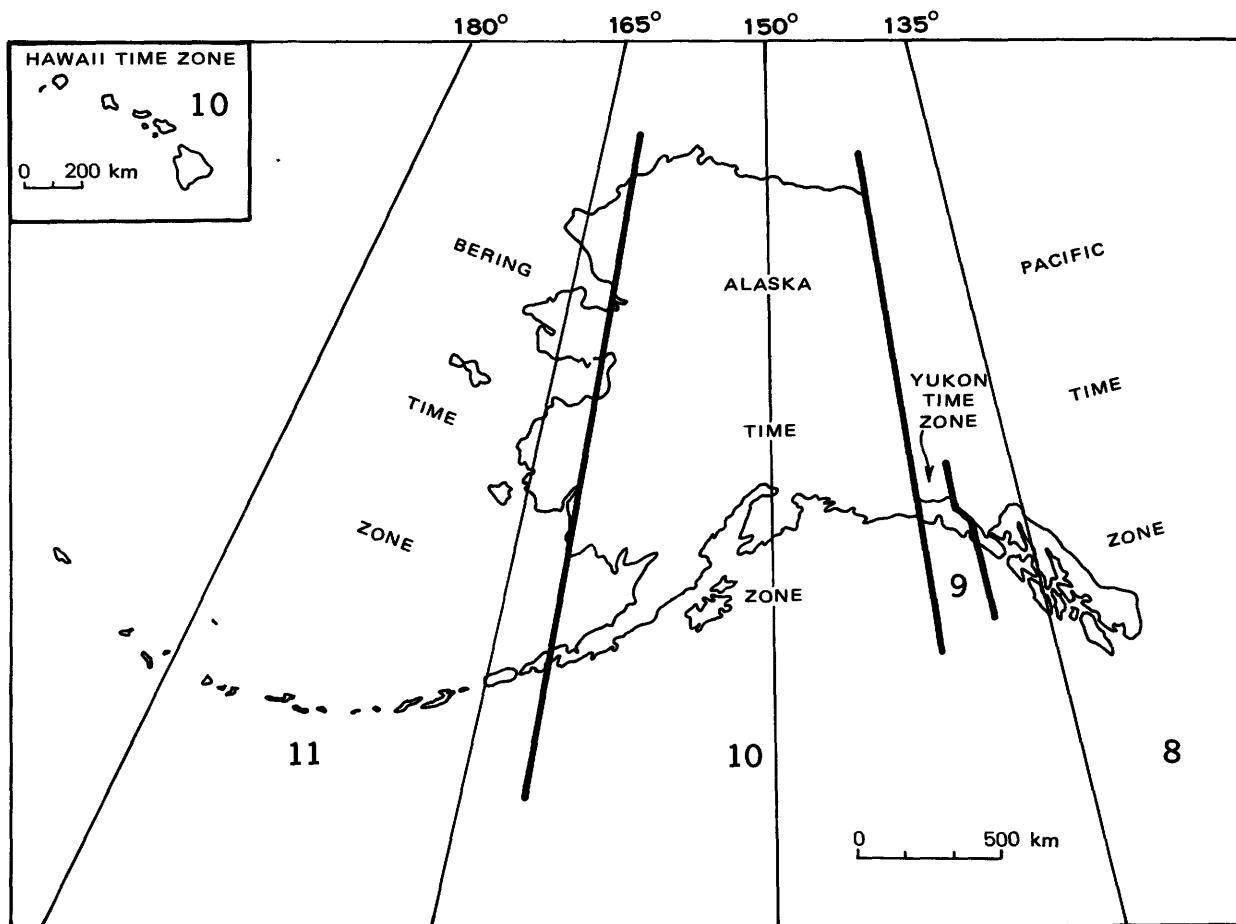


FIGURE 3.--Standard time zones of Alaska and Hawaii. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

distance, where the distance is ≤ 600 km. M_L values are also calculated from other seismometers by conversion of recorded ground motion to the expected response of the torsion seismometer.

$$mbLg = 3.75 + 0.90(\log D) + \log(A/T) \quad (4)$$

$$0.5^\circ \leq D \leq 4^\circ,$$

$$mbLg = 3.30 + 1.66(\log D) + \log(A/T)$$

$$4^\circ \leq D \leq 30^\circ,$$

as proposed by Nuttli (1973), where A/T is expressed in micrometers per second, calculated from the vertical-component 1-second L_g waves, and D is the distance in geocentric degrees.

All of the intensity values (indicated by Roman numerals) listed in this summary were derived, using the Modified Mercalli Intensity Scale of 1931 shown below, from the evaluation of "Earthquake Report" forms; from field reports by U.S. Geological Survey personnel, engineering firms, or universities; and from detailed

macroseismic data communicated to the NEIS by people in the area affected by the earthquake. All earthquake reports received which contain minimal information are assigned an Intensity II. These reports are filed in the offices of the NEIS or in government archives and are available for detailed study.

MODIFIED MERCALLI INTENSITY SCALE OF 1931

Adapted from Sieberg's Mercalli-Cancani scale, modified and condensed.

- I. Not felt - or, except rarely under especially favorable circumstances. Under certain conditions, at and outside the boundary of the area in which a great shock is felt: sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced; sometimes trees, structures, liquids, bodies of

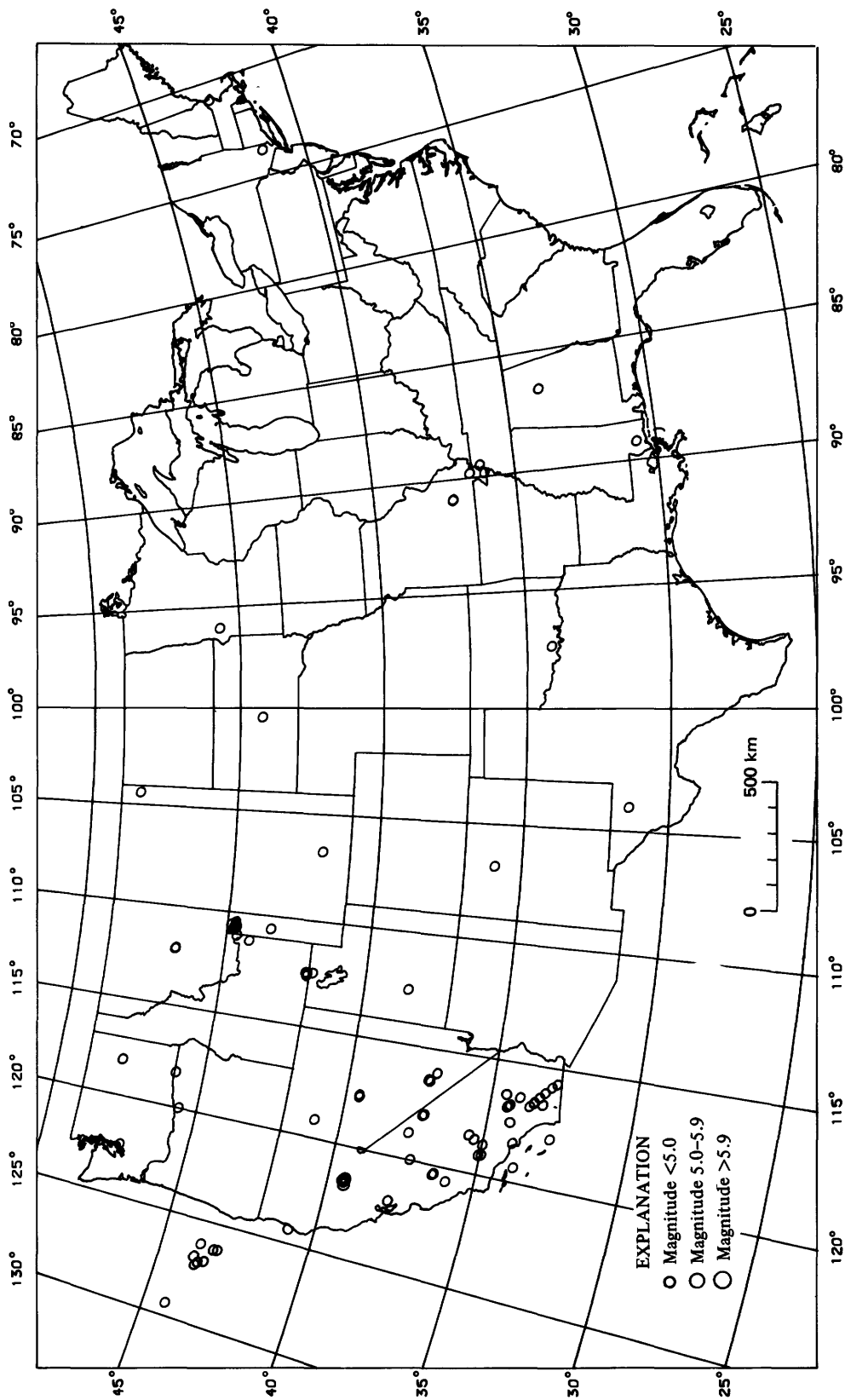


FIGURE 4.--Earthquake epicenters in the conterminous United States for July-September 1975, plotted from table 1.

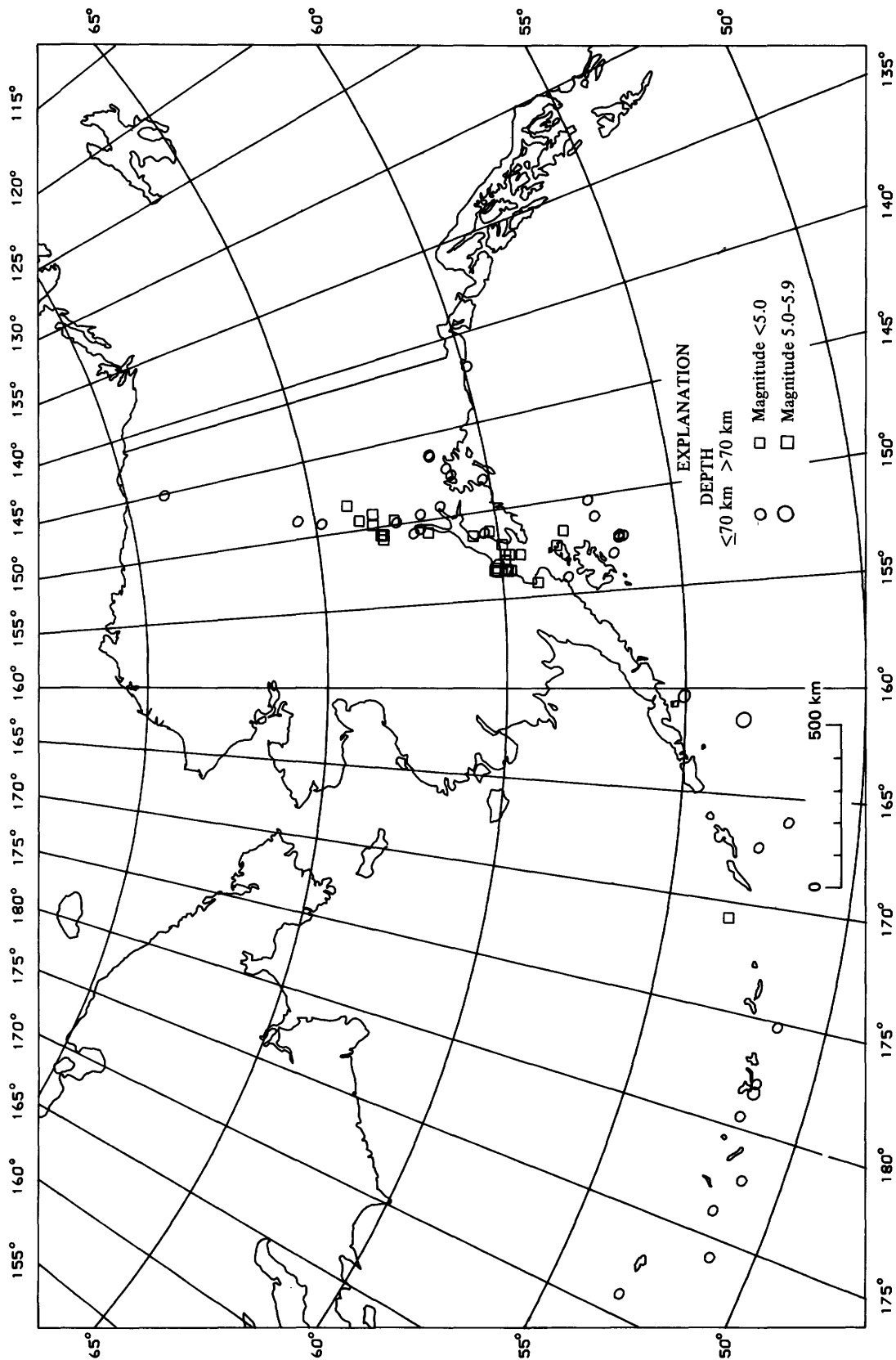


FIGURE 5.--Earthquake epicenters in Alaska for July-September 1975, plotted from table 1.

water, may sway--doors may swing, very slowly.

well-filled open containers. Trees, bushes, shaken slightly.

- II. Felt indoors by few, especially on upper floors, or by sensitive, or nervous persons. Also, as in grade I, but often more noticeably: sometimes hanging objects may swing, especially when delicately suspended; sometimes trees, structures, liquids, bodies of water, may sway, doors may swing, very slowly; sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced.
- III. Felt indoors by several, motion usually rapid vibration. Sometimes not recognized to be an earthquake at first. Duration estimated in some cases. Vibration like that due to passing of light, or lightly loaded trucks, or heavy trucks some distance away. Hanging objects may swing slightly. Movements may be appreciable on upper levels of tall structures. Rocked standing motor cars slightly.
- IV. Felt indoors by many, outdoors by few. Awakened few, especially light sleepers. Frightened no one, unless apprehensive from previous experience. Vibration like that due to passing of heavy or heavily loaded trucks. Sensation like heavy body striking building or falling of heavy objects inside. Rattling of dishes, windows, doors; glassware and crockery clink and clash. Creaking of walls, frame, especially in the upper range of this grade. Hanging objects swung, in numerous instances. Disturbed liquids in open vessels slightly. Rocked standing motor cars noticeably.
- V. Felt indoors by practically all, outdoors by many or most: outdoors direction estimated. Awakened many, or most. Frightened few--slight excitement, a few ran outdoors. Buildings trembled throughout. Broke dishes, glassware, to some extent. Cracked windows--in some cases, but not generally. Overturned vases, small or unstable objects, in many instances, with occasional fall. Hanging objects, doors, swing generally or considerably. Knocked pictures against walls, or swung them out of place. Opened, or closed, doors, shutters, abruptly. Pendulum clocks stopped, started or ran fast, or slow. Moved small objects, furnishings, the latter to slight extent. Spilled liquids in small amounts from
- VI. Felt by all, indoors and outdoors. Frightened many, excitement general, some alarm, many ran outdoors. Awakened all. Persons made to move unsteadily. Trees, bushes, shaken slightly to moderately. Liquid set in strong motion. Small bells rang--church, chapel, school, etc. Damage slight in poorly built buildings. Fall of plaster in small amount. Cracked plaster somewhat, especially fine cracks chimneys in some instances. Broke dishes, glassware, in considerable quantity, also some windows. Fall of knick-knacks, books, pictures. Overturned furniture in many instances. Moved furnishings of moderately heavy kind.
- VII. Frightened all--general alarm, all ran outdoors. Some, or many, found it difficult to stand. Noticed by persons driving motor cars. Trees and bushes shaken moderately to strongly. Waves on ponds, lakes, and running water. Water turbid from mud stirred up. Incaving to some extent of sand or gravel stream banks. Rang large church bells, etc. Suspended objects made to quiver. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary buildings, considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Cracked chimneys to considerable extent, walls to some extent. Fall of plaster in considerable to large amount, also some stucco. Broke numerous windows, furniture to some extent. Shook down loosened brickwork and tiles. Broke weak chimneys at the roof-line (sometimes damaging roofs). Fall of cornices from towers and high buildings. Dislodged bricks and stones. Overturned heavy furniture, with damage from breaking. Damage considerable to concrete irrigation ditches.
- VIII. Fright general--alarm approaches panic. Disturbed persons driving motor cars. Trees shaken strongly--branches, trunks, broken off, especially palm trees. Ejected sand and mud in small amounts. Changes: temporary, permanent; in flow of springs and wells; dry wells renewed flow; in temperature of spring and well waters. Damage slight in structures (brick) built

especially to withstand earthquakes. Considerable in ordinary substantial buildings, partial collapse: racked, tumbled down, wooden houses in some cases; threw out panel walls in frame structures, broke off decayed piling. Fall of walls. Cracked, broke, solid stone walls seriously. Wet ground to some extent, also ground on steep slopes. Twisting, fall, of chimneys, columns, monuments, also factory stacks, towers. Moved conspicuously, overturned, very heavy furniture.

IX. Panic general. Cracked ground conspicuously. Damage considerable in (masonry) structures built especially to withstand earthquakes: Threw out of plumb some wood-frame houses built especially to withstand earthquakes; great in substantial (masonry) buildings, some collapse in large part; or wholly shifted frame buildings off foundations, racked frames; serious to reservoirs; underground pipes sometimes broken.

X. Cracked ground, especially when loose and wet, up to widths of several inches; fissures up to a yard in width ran parallel to canal and stream banks. Landslides considerable from river banks and steep coasts. Shifted sand and mud horizontally on beaches and flat land. Changed level of water in wells. Threw water on banks of canals, lakes, rivers, etc. Damage serious to dams, dikes, embankments. Severe to well-built wooden structures and bridges, some destroyed. Developed dangerous cracks in excellent brick walls. Destroyed most masonry and frame structures, also their foundations. Bent railroad rails slightly. Tore apart, or crushed endwise, pipe lines buried in earth. Open cracks and broad wavy folds in cement pavements and asphalt road surfaces.

XI. Disturbances in ground many and widespread, varying with ground material. Broad fissures, earth slumps, and land slips in soft, wet ground. Ejected water in large amounts charged with sand and mud. Caused sea-waves ("tidal" waves) of significant magnitude. Damage severe to wood-frame structures, especially near shock centers. Great to dams, dikes, embankments often for long distances. Few, if any (masonry) structures remained standing. Destroyed large well-built bridges by the wrecking of supporting piers, or pillars. Affected

yielding wooden bridges less. Bent railroad rails greatly, and thrust them endwise. Put pipe lines buried in earth completely out of service.

XII. Damage total--practically all works of construction damaged greatly or destroyed. Disturbances in ground great and varied, numerous shearing cracks. Landslides, falls of rock of significant character, slumping of river banks, etc., numerous and extensive. Wrenched loose, tore off, large rock masses. Fault slips in firm rock, with notable horizontal and vertical offset displacements. Water channels, surface and underground, disturbed and modified greatly. Dammed lakes, produced waterfalls, deflected rivers, etc. Waves seen on ground surfaces (actually seen, probably, in some cases). Distorted lines of sight and level. Threw objects upward into the air.

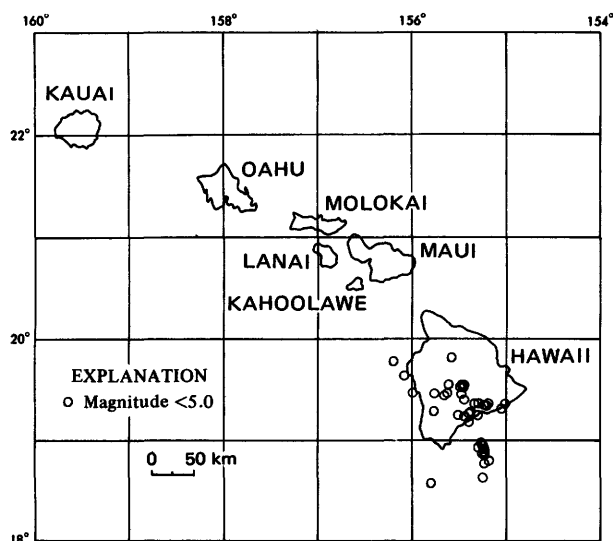


FIGURE 6.--Earthquake epicenters in Hawaii for July-September 1975, plotted from table 1.

Table 1.—Summary of U.S. earthquakes for July–September 1975

[Sources of the hypocenter and magnitudes: (A) United States Energy Research and Development Administration; (B) University of California, Berkeley; (C) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (J) Weston Observatory, Massachusetts; (L) Lamont-Doherty Geological Observatory, Palisades, New York; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (S) St. Louis University, St. Louis, Missouri; (T) University of Oklahoma, Leonard; (U) University of Utah, Salt Lake City; (W) University of Washington, Seattle; (X) LASA Array, Billings, Montana; (Y) Seismological Society of America Bulletin, 1976 (see references); (Z) California Division of Mines and Geology Special Report 124, 1975 (see references). N, normal depth; UTC, Universal Coordinated Time. For names of local time zones, see figures 2 and 3. Leaders (...) indicate no information available]

Date (1975)	Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time				
	hr	min	s				mb	MS	ML or mbLg			Date	Hour			
ALABAMA																
AUG.	29	04	22	51.9	33.82 N.	86.60 W.	5	3.5	...	4.4S	VI	G	AUG.	28	10P.M.	CST
ALASKA																
JULY	2	06	16	09.1	52.72 N.	167.36 W.	65	4.4	...	...	...	G	JULY	1	07P.M.	BST
JULY	8	02	31	38.7	59.92 N.	151.96 W.	106	...	...	...	...	G	JULY	7	04P.M.	AST
JULY	8	20	57	22.7	51.55 N.	178.29 W.	57	5.0	...	...	III	G	JULY	8	09A.M.	BST
JULY	11	09	24	50.6	63.19 N.	150.82 W.	146	...	...	...	...	G	JULY	10	11P.M.	AST
JULY	14	18	09	31.7	60.70 N.	151.28 W.	109	...	...	...	II	G	JULY	14	08A.M.	AST
JULY	15	02	56	52.8	60.17 N.	153.27 W.	148	...	...	...	...	G	JULY	14	04P.M.	AST
JULY	16	04	03	21.8	63.79 N.	149.43 W.	136	...	...	...	...	G	JULY	15	06P.M.	AST
JULY	20	14	24	56.3	59.87 N.	152.54 W.	114	...	...	...	...	G	JULY	20	04A.M.	AST
JULY	21	23	35	08.3	56.82 N.	153.07 W.	21	3.9	...	...	...	G	JULY	21	01P.M.	AST
JULY	24	01	39	27.4	64.04 N.	148.33 W.	120	...	...	...	...	G	JULY	23	03P.M.	AST
JULY	24	05	47	11.5	51.35 N.	175.19 W.	33N	4.4	...	...	...	G	JULY	23	06P.M.	BST
JULY	25	10	40	25.0	55.05 N.	160.38 W.	17	5.8	5.2	...	IV	G	JULY	25	12A.M.	AST
JULY	29	22	01	53.8	60.20 N.	153.40 W.	154	4.4	...	...	...	G	JULY	29	12P.M.	AST
AUG.	1	07	04	33.0	61.92 N.	150.76 W.	79	4.6	...	...	...	G	JULY	31	09P.M.	AST
AUG.	1	23	34	26.8	62.75 N.	149.86 W.	34	...	...	3.2M	...	G	AUG.	1	01P.M.	AST
AUG.	2	10	18	17.9	53.39 N.	161.49 W.	33N	6.2	6.0	...	V	G	AUG.	1	11P.M.	BST
AUG.	2	15	01	35.3	56.63 N.	152.20 W.	33N	4.9	...	...	...	G	AUG.	2	05A.M.	AST
AUG.	4	12	08	20.6	62.06 N.	149.62 W.	69	...	...	...	...	G	AUG.	4	02A.M.	AST
AUG.	6	06	03	26.9	61.50 N.	146.34 W.	38	...	...	3.4M	...	G	AUG.	5	08P.M.	AST
AUG.	8	11	44	38.8	68.96 N.	145.15 W.	33N	4.5	...	...	...	G	AUG.	8	01A.M.	AST
AUG.	8	12	00	22.9	63.24 N.	150.53 W.	145	...	...	...	...	G	AUG.	8	02A.M.	AST
AUG.	10	03	12	46.2	51.20 N.	174.16 E.	17	5.1	4.5	...	...	G	AUG.	9	04P.M.	BST
AUG.	10	14	35	41.7	63.19 N.	150.51 W.	150	...	...	...	...	G	AUG.	10	04A.M.	AST
AUG.	12	23	20	27.0	53.31 N.	170.75 W.	167	4.5	...	...	...	G	AUG.	12	12P.M.	BST
AUG.	17	08	26	59.3	58.41 N.	152.38 W.	72	...	...	...	...	G	AUG.	16	10P.M.	AST
AUG.	18	11	35	50.8	62.33 N.	150.69 W.	5	...	...	3.3M	...	G	AUG.	18	01A.M.	AST
AUG.	18	14	56	42.1	57.36 N.	150.20 W.	25	5.2	4.3	4.7M	...	G	AUG.	18	04A.M.	AST
AUG.	18	21	07	23.3	63.38 N.	149.15 W.	111	...	...	...	...	G	AUG.	18	11A.M.	AST
AUG.	20	01	35	20.9	51.96 N.	166.08 W.	33N	4.6	...	...	...	G	AUG.	19	02P.M.	BST
AUG.	21	07	24	19.8	51.11 N.	177.83 E.	33	5.0	4.3	...	...	G	AUG.	20	08P.M.	BST
AUG.	21	22	19	21.1	60.36 N.	151.19 W.	67	4.9	...	...	V	G	AUG.	21	12P.M.	AST
AUG.	22	15	50	14.3	60.12 N.	153.44 W.	160	4.7	...	...	...	G	AUG.	22	05A.M.	AST
AUG.	23	06	40	27.3	59.01 N.	154.26 W.	167	4.5	...	...	...	G	AUG.	22	08P.M.	AST
AUG.	23	16	14	23.4	64.81 N.	149.26 W.	30	...	...	3.5M	...	G	AUG.	23	06A.M.	AST
AUG.	23	16	56	37.7	58.15 N.	154.09 W.	56	4.3	...	...	...	G	AUG.	23	06A.M.	AST
AUG.	24	04	39	55.7	59.72 N.	153.44 W.	134	4.4	...	...	...	G	AUG.	23	06P.M.	AST
AUG.	24	16	05	16.0	53.07 N.	171.00 E.	24	5.1	3.9	...	...	G	AUG.	24	05A.M.	BST
AUG.	25	14	29	58.6	51.59 N.	176.17 E.	37	4.7	4.4	...	...	G	AUG.	25	03A.M.	BST
AUG.	28	17	46	01.8	58.18 N.	151.64 W.	76	...	...	...	...	G	AUG.	28	07A.M.	AST
AUG.	29	23	18	55.7	61.47 N.	149.30 W.	37	...	...	2.6M	...	G	AUG.	29	01P.M.	AST
AUG.	31	11	10	04.2	62.12 N.	150.47 W.	33N	...	...	3.0M	...	G	AUG.	31	01A.M.	AST
AUG.	31	12	02	10.0	57.25 N.	151.06 W.	12	5.1	4.4	4.9M	...	G	AUG.	31	02A.M.	AST
SEPT.	4	02	26	12.0	65.47 N.	148.82 W.	6	...	...	3.6M	...	G	SEPT.	3	04P.M.	AST
SEPT.	4	03	24	42.2	61.12 N.	147.20 W.	37	...	...	3.2M	...	G	SEPT.	3	05P.M.	AST
SEPT.	6	18	04	59.5	56.63 N.	152.30 W.	33N	5.1	...	4.4M	...	G	SEPT.	6	08A.M.	AST
SEPT.	6	20	35	02.0	56.51 N.	152.28 W.	33N	4.8	...	4.2M	...	G	SEPT.	6	10A.M.	AST
SEPT.	8	23	19	02.2	61.53 N.	146.24 W.	33N	...	...	4.3M	II	G	SEPT.	8	01P.M.	AST
SEPT.	11	10	56	43.2	60.18 N.	148.18 W.	33N	...	...	3.3M	...	G	SEPT.	11	12A.M.	AST
SEPT.	11	21	43	49.9	62.82 N.	149.70 W.	92	...	...	...	...	G	SEPT.	11	11A.M.	AST
SEPT.	12	23	40	13.7	59.74 N.	152.55 W.	117	...	...	...	...	G	SEPT.	12	01P.M.	AST
SEPT.	14	14	31	02.8	60.23 N.	151.16 W.	92	...	...	...	...	G	SEPT.	14	04A.M.	AST
SEPT.	17	08	17	31.8	59.43 N.	152.62 W.	115	...	...	...	...	G	SEPT.	16	10P.M.	AST
SEPT.	17	13	18	14.2	63.42 N.	149.83 W.	133	4.6	...	...	...	G	SEPT.	17	03A.M.	AST
SEPT.	18	07	27	24.4	59.87 N.	153.38 W.	147	...	...	...	...	G	SEPT.	17	09P.M.	AST
SEPT.	19	21	45	59.6	59.83 N.	153.48 W.	139	...	...	...	...	G	SEPT.	19	11A.M.	AST
SEPT.	21	21	05	...	NEAR FAIRBANKS			...	...	...	IV	.	SEPT.	21	11A.M.	AST
SEPT.	24	08	40	01.8	59.87 N.	152.88 W.	124	...	...	...	...	G	SEPT.	23	10P.M.	AST
SEPT.	24	14	17	53.6	59.88 N.	141.85 W.	52	4.2	...	...	...	G	SEPT.	24	04A.M.	AST
SEPT.	27	05	09	42.6	61.02 N.	147.62 W.	33N	...	...	3.0M	...	G	SEPT.	26	07P.M.	AST
SEPT.	29	07	46	33.4	51.55 N.	177.87 W.	49	4.2	...	...	III	G	SEPT.	28	08P.M.	BST
SEPT.	30	08	28	12.2	51.71 N.	179.45 W.	33N	4.6	...	...	II	G	SEPT.	29	09P.M.	BST
SEPT.	30	14	14	00.5	63.18 N.	150.50 W.	145	...	...	...	...	G	SEPT.	30	04A.M.	AST

Table 1.—Summary of U.S. earthquakes for July–September 1975—Continued

Date (1975)		Origin time			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time			
		(UTC)						mb	MS	ML or mbLg			Date	Hour		
		hr	min	s												
CALIFORNIA																
JULY	1	19	47	59.6	35.55 N.	118.41 W.	6	...	...	3.0P	...	P	JULY	1	11A.M.	PST
JULY	1	22	46	53.8	35.54 N.	118.39 W.	3	...	...	3.1P	...	P	JULY	1	02P.M.	PST
JULY	4	00	52	25.2	34.40 N.	116.92 W.	6	...	...	3.0P	...	P	JULY	3	04P.M.	PST
JULY	4	00	56	06.2	34.45 N.	116.87 W.	6	...	...	3.0P	...	P	JULY	3	04P.M.	PST
JULY	4	11	01	43.6	33.33 N.	116.07 W.	19	4.2	...	3.6P	...	P	JULY	4	03A.M.	PST
JULY	7	13	59	08.7	33.96 N.	118.38 W.	13	...	...	3.2P	II	P	JULY	7	05A.M.	PST
JULY	16	11	57	20.5	33.22 N.	116.58 W.	16	...	...	3.2P	...	P	JULY	16	03A.M.	PST
JULY	19	17	28	03.0	34.31 N.	116.85 W.	2	...	...	2.9P	...	P	JULY	19	09A.M.	PST
JULY	27	11	46	55.4	37.12 N.	117.94 W.	3	...	...	2.7P	...	G	JULY	27	03A.M.	PST
JULY	27	12	48	37.9	37.25 N.	117.97 W.	5	...	...	2.9P	...	G	JULY	27	04A.M.	PST
JULY	27	18	41	46.7	33.77 N.	119.33 W.	8	...	...	2.9P	...	P	JULY	27	10A.M.	PST
JULY	28	11	46	09.7	34.99 N.	118.69 W.	8	...	...	3.0P	...	P	JULY	28	03A.M.	PST
AUG.	1	11	42	13.1	33.64 N.	116.75 W.	11	4.9	...	3.3P	...	P	AUG.	1	03A.M.	PST
AUG.	1	15	45	37.8	39.45 N.	121.53 W.	7	...	...	3.8B	V	B	AUG.	1	07A.M.	PST
AUG.	1	16	27	17.8	39.44 N.	121.54 W.	5	4.8	3.2	4.7B	IV	B	AUG.	1	08A.M.	PST
AUG.	1	17	26	50.1	39.46 N.	121.54 W.	9	...	...	3.0B	...	B	AUG.	1	09A.M.	PST
AUG.	1	20	20	04.8	39.44 N.	121.53 W.	8	4.4	...	4.5B	...	B	AUG.	1	12P.M.	PST
AUG.	1	20	20	12.9	39.44 N.	121.53 W.	15	5.8	5.6	5.7B	IX	B	AUG.	1	12P.M.	PST
AUG.	1	20	25		39.44 N.	121.53 W.	..	...	...	4.7B	III	Z	AUG.	1	12P.M.	PST
AUG.	1	20	29		39.44 N.	121.53 W.	..	...	...	4.6B	III	Z	AUG.	1	12P.M.	PST
AUG.	1	20	32	39.8	39.45 N.	121.51 W.	5	...	...	3.0B	...	B	AUG.	1	12P.M.	PST
AUG.	1	20	37		39.45 N.	121.51 W.	..	...	...	3.5B	...	Y	AUG.	1	12P.M.	PST
AUG.	1	20	45		39.45 N.	121.51 W.	..	...	...	3.0B	...	Y	AUG.	1	12P.M.	PST
AUG.	1	20	46	18.4	39.47 N.	121.50 W.	6	...	...	3.8B	...	B	AUG.	1	12P.M.	PST
AUG.	1	21	05	39.8	39.43 N.	121.49 W.	7	...	...	3.0B	...	B	AUG.	1	01P.M.	PST
AUG.	1	21	21	50.7	39.44 N.	121.53 W.	8	5.3	...	4.1B	IV	B	AUG.	1	01P.M.	PST
AUG.	1	21	25	59.0	39.47 N.	121.52 W.	7	...	...	3.3B	...	B	AUG.	1	01P.M.	PST
AUG.	1	21	29	24.1	39.45 N.	121.55 W.	7	...	...	3.6B	...	B	AUG.	1	01P.M.	PST
AUG.	1	23	44	41.0	39.49 N.	121.52 W.	7	...	...	3.2B	...	B	AUG.	1	03P.M.	PST
AUG.	2	00	14	07.7	33.52 N.	116.55 W.	13	4.6	...	4.7P	III	P	AUG.	1	04P.M.	PST
AUG.	2	00	52	48.5	39.48 N.	121.51 W.	7	4.1	2.8	3.8B	...	B	AUG.	1	04P.M.	PST
AUG.	2	06	31	57.2	39.45 N.	121.48 W.	6	...	...	3.2B	...	B	AUG.	1	10P.M.	PST
AUG.	2	10	11	53.7	39.49 N.	121.51 W.	7	...	...	3.1B	...	B	AUG.	2	02A.M.	PST
AUG.	2	10	49	00.1	39.43 N.	121.47 W.	6	...	...	3.3B	...	B	AUG.	2	02A.M.	PST
AUG.	2	11	51	50.7	39.47 N.	121.49 W.	2	...	...	3.4B	...	B	AUG.	2	03A.M.	PST
AUG.	2	14	44	38.7	39.42 N.	121.49 W.	5	...	...	3.1B	...	B	AUG.	2	06A.M.	PST
AUG.	2	16	51	45.1	39.42 N.	121.48 W.	6	4.3	...	3.7B	...	B	AUG.	2	08A.M.	PST
AUG.	2	17	24	29.2	39.47 N.	121.47 W.	6	4.6	...	4.3B	III	B	AUG.	2	09A.M.	PST
AUG.	2	17	43	24.1	39.48 N.	121.47 W.	6	3.9	...	4.0B	III	B	AUG.	2	09A.M.	PST
AUG.	2	19	58	36.9	39.45 N.	121.54 W.	7	...	...	3.1B	...	B	AUG.	2	11A.M.	PST
AUG.	2	20	22	16.3	39.45 N.	121.46 W.	4	5.3	4.5	5.1B	III	B	AUG.	2	12P.M.	PST
AUG.	2	20	35	48.6	39.47 N.	121.48 W.	6	4.3	...	3.9B	...	B	AUG.	2	12P.M.	PST
AUG.	2	20	58	55.7	39.43 N.	121.47 W.	6	...	...	3.8B	...	B	AUG.	2	12P.M.	PST
AUG.	2	20	59	02.7	39.41 N.	121.71 W.	5	5.2	4.7	5.1B	VI	G	AUG.	2	12P.M.	PST
AUG.	2	21	40	01.3	39.43 N.	121.47 W.	6	4.3	...	3.9B	...	B	AUG.	2	01P.M.	PST
AUG.	3	00	29	08.8	33.52 N.	116.57 W.	11	...	...	3.0P	...	P	AUG.	2	04P.M.	PST
AUG.	3	01	03	05.8	39.49 N.	121.52 W.	8	5.0	...	4.6B	III	B	AUG.	2	05P.M.	PST
AUG.	3	02	47	08.8	39.48 N.	121.50 W.	7	4.5	3.3	4.1B	III	B	AUG.	2	06P.M.	PST
AUG.	3	05	57	17.3	36.47 N.	120.35 W.	4	4.6	...	4.0B	III	B	AUG.	2	09P.M.	PST
AUG.	3	06	04	47.7	36.44 N.	120.35 W.	4	3.6	...	3.9B	...	B	AUG.	2	10P.M.	PST
AUG.	3	06	35	16.5	36.46 N.	120.35 W.	5	5.1	4.0	4.9B	VI	B	AUG.	2	10P.M.	PST
AUG.	3	06	37	52.0	36.47 N.	120.35 W.	5	4.1	...	4.4B	II	B	AUG.	2	10P.M.	PST
AUG.	3	08	38	00.2	36.47 N.	120.35 W.	4	...	...	3.6B	...	B	AUG.	3	12A.M.	PST
AUG.	3	09	00	30.2	36.47 N.	120.36 W.	5	...	...	3.5B	...	B	AUG.	3	01A.M.	PST
AUG.	4	09	47	45.0	39.42 N.	121.52 W.	8	...	...	3.5B	...	B	AUG.	4	01A.M.	PST
AUG.	5	02	28	57.4	39.41 N.	121.49 W.	7	...	...	3.3B	...	B	AUG.	4	06P.M.	PST
AUG.	5	20	44	24.5	39.41 N.	121.52 W.	7	...	...	3.2B	...	B	AUG.	5	12P.M.	PST
AUG.	6	03	50	29.9	39.48 N.	121.52 W.	7	5.1	4.0	4.7B	V	B	AUG.	5	07P.M.	PST
AUG.	6	16	25	47.9	39.45 N.	121.46 W.	8	...	...	3.1B	...	B	AUG.	6	08A.M.	PST
AUG.	6	16	41	52.1	39.50 N.	121.53 W.	8	5.2	...	3.6B	...	B	AUG.	6	08A.M.	PST
AUG.	6	21	00	33.5	39.44 N.	121.48 W.	9	...	...	3.0B	...	B	AUG.	6	01P.M.	PST
AUG.	6	21	07	27.0	33.37 N.	116.30 W.	8	...	...	3.2P	...	P	AUG.	6	01P.M.	PST
AUG.	7	20	31	20.4	39.52 N.	121.53 W.	9	...	...	3.1B	...	B	AUG.	7	12P.M.	PST
AUG.	8	07	00	50.1	39.50 N.	121.51 W.	8	5.0	...	4.9B	IV	B	AUG.	7	11P.M.	PST
AUG.	8	13	37	53.9	39.50 N.	121.49 W.	6	...	...	3.2B	...	B	AUG.	8	05A.M.	PST
AUG.	8	19	03	27.2	39.39 N.	121.49 W.	6	...	...	3.1B	...	B	AUG.	8	11A.M.	PST
AUG.	9	07	38	47.5	39.41 N.	121.48 W.	7	...	...	3.0B	...	B	AUG.	8	11P.M.	PST
AUG.	10	05	16	40.5	37.37 N.	119.98 W.	7	4.0	...	3.8B	VI	B	AUG.	9	09P.M.	PST
AUG.	11	02	40	16.7	39.46 N.	121.44 W.	2	...	...	3.0B	...	B	AUG.	10	06P.M.	PST
AUG.	11	06	11	36.3	39.45 N.	121.48 W.	4	4.8	3.8	4.3B	VI	B	AUG.	10	10P.M.	PST
AUG.	11	15	59	05.3	39.47 N.	121.55 W.	6	4.0	...	3.6B	...	B	AUG.	11	07A.M.	PST
AUG.	13	13	57	46.9	35.32 N.	118.53 W.	6	...	...	3.1P	...	P	AUG.	13	05A.M.	PST

Table 1.—Summary of U.S. earthquakes for July–September 1975—Continued

Date (1975)	Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time		
	hr	min	s				mb	MS	ML or mbLg			Date	Hour	
CALIFORNIA--Continued														
AUG. 14	04	29	58.5	35.08 N.	119.16 W.	15	3.9	...	3.7P	...	P	AUG. 13	08P.M.	PST
AUG. 14	08	08	49.8	34.02 N.	116.43 W.	11	4.2	...	4.0P	V	P	AUG. 14	12A.M.	PST
AUG. 14	08	10	36.7	34.03 N.	116.44 W.	10	...	...	3.8P	III	P	AUG. 14	12A.M.	PST
AUG. 14	08	59	19.8	34.03 N.	116.44 W.	1	...	...	3.0P	...	P	AUG. 14	12A.M.	PST
AUG. 15	22	27	51.8	36.49 N.	120.39 W.	6	4.5	...	4.5B	III	B	AUG. 15	02P.M.	PST
AUG. 16	05	48	09.4	39.47 N.	121.52 W.	9	4.3	...	4.0B	III	B	AUG. 15	09P.M.	PST
AUG. 17	00	24	26.0	37.61 N.	118.81 W.	5	...	...	4.0B	II	G	AUG. 16	04P.M.	PST
AUG. 18	01	25	22.9	32.82 N.	115.63 W.	17	...	...	3.1P	...	P	AUG. 17	05P.M.	PST
AUG. 19	10	14	35.5	34.25 N.	117.56 W.	8	...	...	3.3P	...	P	AUG. 19	02A.M.	PST
AUG. 20	04	37	16.9	34.50 N.	116.48 W.	3	...	...	3.4P	...	P	AUG. 19	08P.M.	PST
AUG. 23	18	31	53.3	39.50 N.	121.49 W.	2	...	...	3.1B	...	Z	AUG. 23	10A.M.	PST
AUG. 24	09	10	37.7	39.51 N.	121.50 W.	2	...	...	3.3B	...	Z	AUG. 24	01A.M.	PST
AUG. 25	13	35	11.7	39.34 N.	121.51 W.	2	...	...	3.2B	...	Z	AUG. 25	05A.M.	PST
AUG. 26	08	39	27.5	34.97 N.	119.12 W.	5	...	...	3.3P	...	P	AUG. 26	12A.M.	PST
AUG. 29	07	52	42.6	36.51 N.	120.39 W.	5	4.0	...	3.8B	V	B	AUG. 28	11P.M.	PST
SEPT. 5	21	01	39.2	39.41 N.	121.52 W.	2	...	...	3.2B	...	Z	SEPT. 5	01P.M.	PST
SEPT. 10	10	39	...	NEAR OROVILLE	...	...	...	...	3.5B	II	.	SEPT. 10	02A.M.	PST
SEPT. 10	12	38	...	NEAR OROVILLE	...	...	...	...	3.0B	II	.	SEPT. 10	04A.M.	PST
SEPT. 10	17	39	05.2	39.52 N.	121.54 W.	1	...	...	3.4B	II	Z	SEPT. 10	09A.M.	PST
SEPT. 11	08	44	45.4	33.02 N.	115.82 W.	10	...	...	3.2P	...	P	SEPT. 11	12A.M.	PST
SEPT. 12	02	00	47.9	39.50 N.	121.49 W.	0	...	...	3.5B	...	Z	SEPT. 11	06P.M.	PST
SEPT. 13	21	20	59.8	36.00 N.	120.56 W.	13	4.9	4.3	4.8B	VI	B	SEPT. 13	01P.M.	PST
SEPT. 15	12	31	16.4	37.81 N.	121.97 W.	10	...	...	2.8B	IV	G	SEPT. 15	04A.M.	PST
SEPT. 16	12	41	11.1	32.65 N.	117.90 W.	16	...	...	3.4P	...	P	SEPT. 16	04A.M.	PST
SEPT. 26	02	31	07.1	39.50 N.	121.50 W.	11	4.1	...	4.0B	II	B	SEPT. 25	06P.M.	PST
SEPT. 26	09	57	15.2	39.44 N.	121.61 W.	10	...	...	2.9B	IV	G	SEPT. 26	01A.M.	PST
SEPT. 27	22	34	38.1	39.51 N.	121.54 W.	8	5.3	3.5	4.6B	IV	B	SEPT. 27	02P.M.	PST
SEPT. 27	23	04	30.4	39.52 N.	121.53 W.	11	...	...	3.1G	...	G	SEPT. 27	03P.M.	PST
SEPT. 27	23	28	04.7	39.53 N.	121.54 W.	10	...	...	3.1B	...	G	SEPT. 27	03P.M.	PST
SEPT. 28	21	07	15.0	39.52 N.	121.53 W.	..	...	...	3.4B	...	Z	SEPT. 28	01P.M.	PST
CALIFORNIA-OFF THE COAST														
SEPT. 9	02	43	42.5	40.92 N.	124.40 W.	27	4.9	...	4.6B	IV	G	SEPT. 8	06P.M.	PST
HAWAII														
JULY 5	03	40	55.1	19.35 N.	155.32 W.	28	...	...	4.2H	IV	H	JULY 4	05P.M.	HST
JULY 6	09	18	18.3	19.45 N.	155.60 W.	1	...	...	4.3H	IV	H	JULY 5	11P.M.	HST
JULY 6	09	25	45.9	19.43 N.	155.64 W.	4	...	...	4.4H	IV	H	JULY 5	11P.M.	HST
JULY 7	15	39	48.6	19.51 N.	155.45 W.	7	...	...	3.6H	III	H	JULY 7	05A.M.	HST
JULY 7	18	28	22.0	19.51 N.	155.45 W.	8	...	...	3.5H	...	H	JULY 7	08A.M.	HST
JULY 8	00	47	41.9	19.51 N.	155.48 W.	1	3.9	...	4.4H	IV	H	JULY 7	02P.M.	HST
JULY 8	04	39	52.2	19.51 N.	155.45 W.	7	...	...	4.3H	IV	G	JULY 7	06P.M.	HST
JULY 8	11	09	07.5	19.52 N.	155.47 W.	7	...	...	3.9H	III	H	JULY 8	01A.M.	HST
JULY 9	07	07	02.6	19.51 N.	155.46 W.	6	...	...	4.1H	IV	H	JULY 8	09P.M.	HST
JULY 9	13	49	27.5	19.51 N.	155.46 W.	7	...	...	3.7H	...	H	JULY 9	03A.M.	HST
JULY 9	15	47	42.7	19.52 N.	155.46 W.	7	...	...	4.3H	IV	H	JULY 9	05A.M.	HST
JULY 9	18	40	03.4	19.51 N.	155.47 W.	7	...	...	4.5H	IV	H	JULY 9	08A.M.	HST
JULY 9	23	34	23.7	19.52 N.	155.46 W.	7	...	...	3.4H	...	H	JULY 9	01P.M.	HST
JULY 19	07	19	58.1	19.34 N.	155.01 W.	8	...	...	3.4H	III	H	JULY 18	09P.M.	HST
JULY 23	01	12	32.7	19.78 N.	156.20 W.	41	...	...	4.4H	III	H	JULY 22	03P.M.	HST
JULY 26	09	14	59.3	19.81 N.	155.56 W.	38	...	...	3.7H	...	H	JULY 25	11P.M.	HST
JULY 30	23	31	22.4	19.52 N.	155.60 W.	11	...	...	3.9H	III	H	JULY 30	01P.M.	HST
JULY 31	11	44	28.9	19.46 N.	155.98 W.	15	...	...	3.3H	...	H	JULY 31	01A.M.	HST
AUG. 4	07	09	29.4	19.45 N.	155.74 W.	8	...	...	3.0H	...	H	AUG. 3	09P.M.	HST
AUG. 5	15	51	36.3	19.18 N.	155.39 W.	20	...	...	3.3H	...	H	AUG. 5	05A.M.	HST
AUG. 5	17	36	38.6	19.25 N.	155.39 W.	1	...	...	3.3H	III	H	AUG. 5	07A.M.	HST
AUG. 6	02	53	50.7	19.27 N.	155.38 W.	6	...	...	3.1H	...	H	AUG. 5	04P.M.	HST
AUG. 18	17	08	55.9	19.62 N.	156.09 W.	49	...	...	3.9H	III	H	AUG. 18	07A.M.	HST
AUG. 22	14	46	09.1	19.33 N.	155.20 W.	9	...	...	3.0H	...	H	AUG. 22	04A.M.	HST
AUG. 24	15	45	35.4	19.35 N.	155.28 W.	33	...	...	3.6H	III	H	AUG. 24	05A.M.	HST
AUG. 26	03	54	11.2	18.89 N.	155.27 W.	23	...	...	3.0H	...	H	AUG. 25	05P.M.	HST
AUG. 26	19	43	54.1	18.60 N.	155.24 W.	54	...	...	3.3H	...	H	AUG. 26	09A.M.	HST
AUG. 27	16	36	20.4	18.79 N.	155.19 W.	9	...	...	3.0H	...	H	AUG. 27	06A.M.	HST
AUG. 27	17	34	44.2	19.44 N.	155.47 W.	8	...	...	4.1H	IV	H	AUG. 27	07A.M.	HST
AUG. 27	23	24	30.9	18.86 N.	155.22 W.	24	...	...	3.1H	...	H	AUG. 27	01P.M.	HST
AUG. 29	19	56	03.7	18.83 N.	155.24 W.	24	...	...	3.1H	...	H	AUG. 29	09A.M.	HST
SEPT. 1	19	48	00.7	18.87 N.	155.24 W.	5	...	...	3.1H	...	H	SEPT. 1	09A.M.	HST
SEPT. 1	22	39	25.9	18.89 N.	155.24 W.	13	...	...	3.3H	...	H	SEPT. 1	12P.M.	HST
SEPT. 3	06	05	40.2	18.86 N.	155.25 W.	12	...	...	3.1H	...	H	SEPT. 2	08P.M.	HST
SEPT. 4	07	53	32.7	18.83 N.	155.24 W.	30	...	...	3.1H	...	H	SEPT. 3	09P.M.	HST

Table 1.—Summary of U.S. earthquakes for July–September 1975—Continued

Date (1975)	Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time	
	hr	min	s				mb	MS	ML or mbLg			Date	Hour
HAWAII--Continued													
SEPT. 4	08 04	15.6	18.83 N.	155.23 W.	9	...	...	3.1H	...	H	SEPT. 3	10P.M.	HST
SEPT. 4	08 15	19.8	18.84 N.	155.24 W.	28	...	...	3.0H	...	H	SEPT. 3	10P.M.	HST
SEPT. 4	09 08	45.4	18.84 N.	155.23 W.	25	...	...	3.0H	...	H	SEPT. 3	11P.M.	HST
SEPT. 4	16 55	49.6	18.76 N.	155.22 W.	15	...	...	3.0H	...	H	SEPT. 4	06A.M.	HST
SEPT. 4	17 09	45.8	18.84 N.	155.22 W.	21	...	...	3.0H	...	H	SEPT. 4	07A.M.	HST
SEPT. 6	10 55	29.9	18.87 N.	155.24 W.	24	...	...	3.1H	...	H	SEPT. 6	12A.M.	HST
SEPT. 7	16 35	41.0	18.89 N.	155.24 W.	10	...	...	3.1H	...	H	SEPT. 7	06A.M.	HST
SEPT. 10	18 34	11.0	19.35 N.	155.19 W.	2	...	...	3.5H	III	H	SEPT. 10	08A.M.	HST
SEPT. 11	14 43	56.1	18.55 N.	155.79 W.	1	...	...	3.0H	...	H	SEPT. 11	04A.M.	HST
SEPT. 17	05 38	04.9	19.23 N.	155.30 W.	43	...	...	3.2H	...	H	SEPT. 16	07P.M.	HST
SEPT. 19	23 02	59.1	19.35 N.	155.01 W.	8	...	...	3.0H	...	H	SEPT. 19	01P.M.	HST
SEPT. 20	05 24	28.3	19.22 N.	155.53 W.	7	...	...	3.1H	...	H	SEPT. 19	07P.M.	HST
SEPT. 22	05 46	05.1	19.33 N.	155.21 W.	7	...	...	3.2H	III	H	SEPT. 21	07P.M.	HST
SEPT. 22	12 10	06.9	19.39 N.	155.42 W.	8	...	...	3.4H	...	H	SEPT. 22	02A.M.	HST
SEPT. 25	11 38	59.7	19.23 N.	155.50 W.	44	...	...	3.1H	...	H	SEPT. 25	01A.M.	HST
SEPT. 25	20 59	21.7	18.91 N.	155.29 W.	13	...	...	3.0H	...	H	SEPT. 25	10A.M.	HST
SEPT. 28	10 39	00.1	18.97 N.	155.26 W.	9	...	...	3.8H	...	H	SEPT. 28	12A.M.	HST
SEPT. 30	14 03	35.3	19.28 N.	155.77 W.	11	...	...	3.0H	...	H	SEPT. 30	04A.M.	HST
IDAHO													
AUG. 16	21 20	53.6	42.12 N.	112.45 W.	10	...	...	3.6U	...	U	AUG. 16	02P.M.	MST
SEPT. 8	11 56	44.9	44.20 N.	111.28 W.	19	...	...	2.5A	...	G	SEPT. 8	04A.M.	MST
SEPT. 12	18 26	06.4	42.07 N.	112.57 W.	5	...	...	4.0U	III	G	SEPT. 12	11A.M.	MST
SEPT. 12	18 57	22.7	42.09 N.	112.49 W.	5	...	...	...	...	G	SEPT. 12	11A.M.	MST
SEPT. 22	10 42	36.2	42.07 N.	112.45 W.	3	4.2	...	3.6U	IV	U	SEPT. 22	03A.M.	MST
MASSACHUSETTS													
AUG. 3	01 03	22.0	42.67 N.	70.85 W.	5	...	...	2.4J	III	J	AUG. 2	08P.M.	EST
MINNESOTA													
JULY 9	14 54	15.1	45.67 N.	96.04 W.	10	4.6	...	4.8S	VI	G	JULY 9	08A.M.	CST
MISSISSIPPI													
SEPT. 9	11 52	44.1	30.66 N.	89.25 W.	5	...	...	2.9T	IV	G	SEPT. 9	05A.M.	CST
MISSOURI													
AUG. 20	09 14	16.6	36.56 N.	89.80 W.	5	...	...	2.9S	...	S	AUG. 20	03A.M.	CST
AUG. 25	00 44	14.5	37.23 N.	90.89 W.	5	...	...	2.7S	...	S	AUG. 24	06P.M.	CST
AUG. 25	03 01	28.4	37.23 N.	90.88 W.	5	...	...	2.8S	...	S	AUG. 24	09P.M.	CST
AUG. 25	07 11	08.0	36.05 N.	89.84 W.	11	...	...	3.0S	...	S	AUG. 25	01A.M.	CST
MONTANA													
JULY 18	15 06	22.5	46.72 N.	112.12 W.	5	...	...	3.9G	IV	G	JULY 18	08A.M.	MST
JULY 18	18 39	02.6	46.69 N.	112.13 W.	5	...	...	3.1G	II	G	JULY 18	11A.M.	MST
JULY 19	12 00	22.8	46.69 N.	112.10 W.	5	...	...	3.5G	II	G	JULY 19	05A.M.	MST
AUG. 17	10 24	14.3	44.67 N.	111.11 W.	5	...	...	...	...	G	AUG. 17	03A.M.	MST
SEPT. 5	20 47	40.7	48.36 N.	104.38 W.	5	...	...	3.8X	...	G	SEPT. 5	01P.M.	MST
NEVADA													
JULY 1	04 50	31.9	37.28 N.	116.35 W.	5	4.5	...	4.2B	...	G	JUNE 30	08P.M.	PST
JULY 1	18 14	08.8	37.22 N.	116.43 W.	5	4.7	...	4.8B	...	G	JULY 1	10A.M.	PST
JULY 13	01 16	30.6	39.55 N.	117.68 W.	5	...	...	4.0B	...	G	JULY 12	05P.M.	PST
JULY 13	01 36	54.0	39.55 N.	117.64 W.	5	...	...	4.2B	...	G	JULY 12	05P.M.	PST
AUG. 31	11 27	39.7	40.95 N.	119.11 W.	33N	...	...	4.2B	...	G	AUG. 31	03A.M.	PST
SEPT. 6	17 00	00.1	37.02 N.	116.03 W.	0	4.6	...	4.3B	...	A	SEPT. 6	09A.M.	PST
NEW MEXICO													
SEPT. 29	11 09	42.9	35.95 N.	106.79 W.	5	...	...	2.8G	...	G	SEPT. 29	04A.M.	MST

Table 1.—Summary of U.S. earthquakes for July–September 1975—Continued

Date (1975)		Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time		
		hr	min	s				mb	MS	ML or mbLg			Date	Hour	
NEW YORK															
JULY	19	20	59	32.2	41.43 N.	73.79 W.	3	...	...	2.3L	III	L	JULY	19	03P.M. EST
OKLAHOMA															
SEPT.	13	01	25	02.8	34.14 N.	97.37 W.	5	...	...	3.4T	IV	G	SEPT.	12	07P.M. CST
OREGON															
JULY	1	05	29	02.0	45.63 N.	120.00 W.	5	...	...	3.5G	...	W	JUNE	30	09P.M. PST
JULY	7	20	41	14.2	45.96 N.	118.25 W.	5	...	...	2.9G	...	G	JULY	7	12P.M. PST
OREGON-OFF THE COAST															
JULY	15	04	36	23.9	44.25 N.	129.34 W.	33N	4.2	...	...	...	G	JULY	14	08P.M. PST
JULY	17	07	33	56.9	43.80 N.	126.77 W.	33N	3.9	...	...	...	G	JULY	16	11P.M. PST
JULY	24	05	39	57.1	43.20 N.	126.21 W.	33N	4.9	...	...	...	G	JULY	23	09P.M. PST
JULY	25	04	13	21.5	43.61 N.	127.02 W.	33N	4.5	3.8	...	...	G	JULY	24	08P.M. PST
JULY	27	04	15	41.0	43.68 N.	127.16 W.	31	4.7	4.2	...	...	G	JULY	26	08P.M. PST
JULY	29	01	48	16.2	43.69 N.	126.10 W.	33N	5.2	3.8	...	...	;	JULY	28	05P.M. PST
AUG.	6	21	38	07.8	43.09 N.	126.19 W.	33N	4.9	...	...	...	G	AUG.	6	01P.M. PST
SEPT.	25	06	26	40.2	43.40 N.	126.87 W.	33N	4.2	3.4	...	...	G	SEPT.	24	10P.M. PST
SOUTH DAKOTA															
AUG.	25	10	00	17.0	44.25 N.	100.45 W.	5	...	...	3.1S	...	G	AUG.	25	04A.M. CST
TENNESSEE															
JULY	6	8	8	3.9	36.19 N.	89.49 W.	5	...	...	2.9S	II	S	JULY	60	02A.M. CST
TEXAS															
AUG.	1	07	27	57.3	31.42 N.	104.01 W.	5	4.8	...	3.0T	II	G	AUG.	1	12A.M. MST
UTAH															
SEPT.	10	06	39	42.5	38.48 N.	112.56 W.	5	...	...	3.3U	II	G	SEPT.	9	11P.M. MST
SEPT.	14	04	13	24.2	41.87 N.	112.43 W.	5	...	...	...	III	G	SEPT.	13	09P.M. MST
WASHINGTON															
JULY	14	05	50	34.6	47.32 N.	122.41 W.	7	...	...	3.4G	V	W	JULY	13	09P.M. PST
JULY	24	11	42	11.8	47.32 N.	122.41 W.	6	...	...	3.0G	V	W	JULY	24	03A.M. PST
SEPT.	18	12	19	27.1	47.85 N.	118.16 W.	1	...	...	3.5G	...	W	SEPT.	18	04A.M. PST
WYOMING															
JULY	1	04	16	22.5	44.88 N.	110.58 W.	5	4.8	...	4.4G	II	G	JUNE	30	09P.M. MST
JULY	1	15	57	47.8	44.79 N.	110.74 W.	5	...	...	3.4G	II	G	JULY	1	08A.M. MST
JULY	2	08	29	29.6	44.79 N.	110.76 W.	5	...	...	3.3G	II	G	JULY	2	01A.M. MST
JULY	2	19	54	56.7	44.72 N.	110.57 W.	5	4.2	...	3.9G	...	G	JULY	2	12P.M. MST
JULY	3	03	21	34.0	44.75 N.	110.46 W.	5	4.5	...	3.8G	...	G	JULY	2	08P.M. MST
JULY	5	19	17	39.0	44.71 N.	110.62 W.	5	4.5	...	4.3G	IV	G	JULY	5	12P.M. MST
JULY	5	20	08	29.7	44.76 N.	110.64 W.	5	3.5	...	3.5G	III	G	JULY	5	01P.M. MST
JULY	6	05	12	17.7	44.72 N.	110.68 W.	5	...	...	...	...	G	JULY	5	10P.M. MST
JULY	7	00	51	27.9	44.76 N.	110.57 W.	5	4.3	...	3.6G	II	G	JULY	6	05P.M. MST
JULY	11	05	37	41.2	44.70 N.	110.74 W.	5	3.7	...	3.3G	...	G	JULY	10	10P.M. MST
JULY	11	16	39	22.1	41.98 N.	106.73 W.	5	...	...	...	II	G	JULY	11	09A.M. MST
JULY	13	10	01	07.2	44.70 N.	110.67 W.	5	4.4	...	3.8G	IV	G	JULY	13	03A.M. MST
JULY	17	19	04	54.3	43.51 N.	110.59 W.	5	3.3	...	3.3A	...	G	JULY	17	12P.M. MST

Table 2.—Summary of macroseismic data for
U.S. earthquakes, July–September 1975

[Sources of the hypocenter and magnitudes: (A) U.S. Energy Research and Development Administration; (B) University of California, Berkeley; (C) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (J) Weston Observatory, Massachusetts; (L) Lamont-Doherty Geological Observatory, Palisades, New York; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (S) St. Louis University, St. Louis, Missouri; (T) University of Oklahoma, Leonard; (U) University of Utah, Salt Lake City; (V) Virginia Polytechnic Institute and State University, Blacksburg; (W) University of Washington, Seattle; (Z) California Division of Mines and Geology Special Report 124, 1975 (see references). Dates and origin times are listed in Universal Coordinated Time (UTC), giving the hour, minute, and second. Epicenters are shown in decimal degrees. Only earthquakes with intensity data and explosions are listed]

Alabama

29 August (G) Northern Alabama

Origin time: 04 22 51.9

Epicenter: 33.82 N., 86.60 W.

Depth: 5 km

Magnitude: 3.5 mb, 4.4 mbLg(S),
4.3 mbLg(V)

Felt over an area of approximately 25,000
sq km (fig. 7).

Intensity VI: Palmydale (ceiling
damage), Watson (slight damage).

Intensity V: Allgood, Altoona, Burnwell,
Coalburg, Columbiana, Haleyville,
Trafford, Wattsville.

Intensity IV: Many in these communities
awakened from sleep:

Table 2.—Summary of macroseismic data for U.S.
earthquakes, July–September 1975—Continued

Alabama--Continued

Alabama--Acmar, Addison, Adger, Alden,
Alexandria, Alpine, Alton, Arab,
Arley, Baileytown, Bear Creek,
Bessemer, Birmingham (press report),
Blountsville, Bon Air, Brilliant,
Brookside, Bynum, Cardiff, Clanton,
Clay, Collinsville, Cooks Springs,
Cragford, Cropwell, Delta, Dixiana,
Dora, Double Springs, Eldridge,
Fairfield, Gadsden (press report),
Gallant, Geraldine, Goodwater,
Hamilton, Harpersville, Hartselle,
Heflin, Henager, Huntsville, Joppa,
Leeds, Lincoln, Morris, Moundville,
Muscadine, New Castle, New Hope,
Odenville, Paint Rock, Pelham,
Pinson, Ragland, Remlap, Riverside,
Sayre, Shelby, Siluria, Sterrett,
Sycamore, Sylacauga, Talladega,
Tanner, Thorsby, Trussville, Union
Grove, Verbena, Walnut Grove.

Tennessee--Five Points (press report),
Taft.

Intensity III: Belle Mina, Brent,
Crossville, Dolomite, Grayson,
Horton, Kimberly, Moulton,
Springville, Trinity, Vinemont,
Wilsonville.

Intensity II: Cedar Bluff, Choccolocco,
Cleveland, Maplesville, West Blocton.

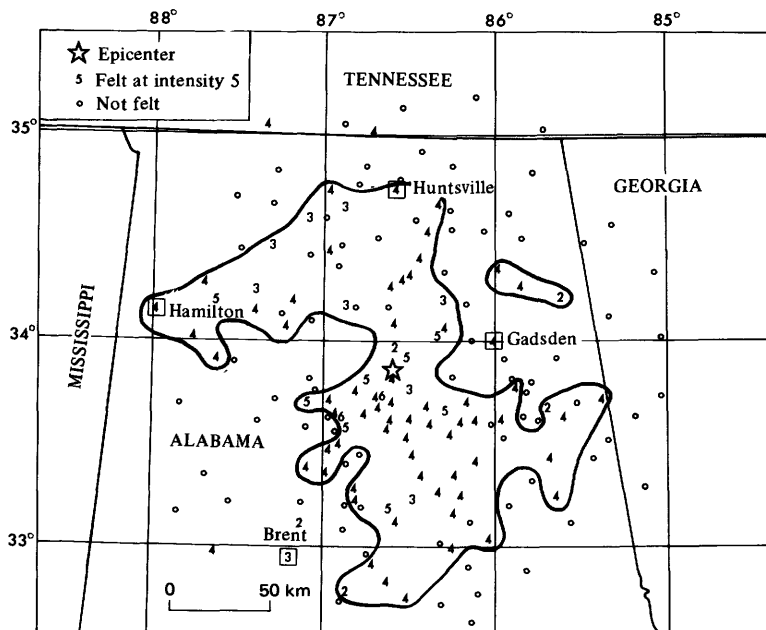


FIGURE 7.—Intensity map for the northern Alabama earthquake of 29 August 1975, 04 22 51.9 UTC, with the contiguous felt area contoured. Arabic numbers are used to represent modified Mercalli intensities at specific sites.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Alaska	
8 July (G)	Andreanof Islands, Aleutian Islands Origin time: 20 57 22.7 Epicenter: 51.55 N., 178.29 W. Depth: 57 km Magnitude: 5.0 mb <u>Intensity III</u> : Adak.
14 July (G)	Kenai Peninsula Origin time: 18 09 31.7 Epicenter: 60.70 N., 151.28 W. Depth: 109 km Magnitude: None computed. <u>Intensity II</u> : Kenai Peninsula, Palmer.
25 July (G)	Alaska Peninsula Origin time: 10 40 25.0 Epicenter: 55.05 N., 160.38 W. Depth: 17 km Magnitude: 5.8 mb, 5.2 MS Reported to have been felt strongly at Sand Point (unconfirmed). <u>Intensity IV</u> : Cold Bay.
2 August (G)	Alaska Peninsula Origin time: 10 18 17.9 Epicenter: 53.39 N., 161.49 W. Depth: Normal Magnitude: 6.2 mb, 6.0 MS <u>Intensity V</u> : King Cove. <u>Intensity IV</u> : Cold Bay.
21 August (G)	Kenai Peninsula Origin time: 22 19 21.1 Epicenter: 60.36 N., 151.19 W. Depth: 67 km Magnitude: 4.9 mb <u>Intensity V</u> : Homer.
8 September (G)	Southern Alaska Origin time: 23 19 02.2 Epicenter: 61.53 N., 146.24 W. Depth: Normal Magnitude: 4.3 ML(M) <u>Intensity II</u> : Valdez.
21 September (G)	Central Alaska Origin time: 21 05 Epicenter: Not located. Depth: None computed. Magnitude: None computed. <u>Intensity IV</u> : Fairbanks.
29 September (G)	Andreanof Islands, Aleutian Islands Origin time: 07 46 33.4 Epicenter: 51.55 N., 177.87 W. Depth: 49 km Magnitude: 4.2 mb <u>Intensity III</u> : Adak.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Alaska—Continued	
30 September (G)	Andreanof Islands, Aleutian Islands Origin time: 08 28 12.2 Epicenter: 51.71 N., 179.45 W. Depth: Normal Magnitude: 4.6 mb <u>Intensity II</u> : Adak.
California	
7 July (P)	Southern California Origin time: 13 59 8.7 Epicenter: 33.96 N., 118.38 W. Depth: 13 km Magnitude: 3.2 ML <u>Intensity II</u> : Inglewood area.
1 August (B)	Northern California Origin time: 15 45 37.8 Epicenter: 39.45 N., 121.53 W. Depth: 7 km Magnitude: 3.8 ML The felt information is incomplete owing to confusion in responses to this earthquake with effects of the main shock, which occurred 5 hours later at 20 20 12.9. <u>Intensity V</u> : Browns Valley, Durham, Dutch Flat, East Nicolaus, Forbestown, Gridley, Oregon House, Oroville, Palermo, Stirling City. <u>Intensity IV</u> : Applegate, Beale AFB, Berry Creek, Foresthill, Georgetown, Gold Run, Goodyears Bar, Grass Valley. <u>Intensity III</u> : Live Oak, Meadow Valley. <u>Intensity II</u> : Caribou, Chico, Esparto, Lincoln, Pleasant Grove, Stonyford, Storrer, Wheatland.
1 August (B)	Northern California Origin time: 16 27 17.8 Epicenter: 39.44 N., 121.54 W. Depth: 5 km Magnitude: 4.8 mb(G), 3.2 MS(G), 4.7 ML <u>Intensity IV</u> : Beale AFB (telegram). <u>Intensity III</u> : Throughout Butte County (B).
1 August (B)	Northern California Origin time: 20 20 12.9 Epicenter: 39.44 N., 121.53 W. Depth: 15 km Magnitude: 5.8 mb(G), 5.6 MS(G), 5.7 ML The series of Oroville earthquakes listed in table 1 began with the first felt shock at 07:45 a.m. PST (15 45 37.8 UTC, August 1). This was felt by only

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

a few, had a magnitude of 3.8 ML(B), and was followed by the shock of 08:27 a.m. PST (16 27 17.8 UTC). It had a magnitude of 4.8 ML(B) and was also felt by only a few, with maximum intensity IV. The second earthquake was canvassed, but most respondents referred to the third and largest shock, which occurred at 12:20 p.m. PST (20 20 12.9 UTC, August 1), magnitude 5.7 ML(B). Data received could not be completely separated for each earthquake.

Total felt area for the main shock was 120,000 sq km (fig. 8). Preliminary felt area and intensity information appears in Sherburne and Hauge (1975, p. 97). Total damage estimated by the mayor of Oroville was between 2 and 3 million dollars.

The following reports about the effects of the earthquake have been collected and are listed in order of felt intensity:

A maximum intensity of IX was assigned to the area of the 3.8 km-long fracture zone located about 5.1 km south of Lake Oroville. The block to the east of the fault moved upwards relative to the west as evidenced by a slip of at least 55 mm across the surface ruptures and by 180 mm of vertical movement of a benchmark near the rupture zone (Clark and others, 1976).

The Union, Grass Valley–Nevada City, California, of Saturday, August 2, 1975, reported: "Damage in northern California was limited to Oroville, the 125 year old county seat of rural Butte County, 125 miles northeast of San Francisco. Plate-glass windows in several downtown stores shattered, store merchandise was toppled from shelves, plaster and ceiling tiles crashed down and some walls cracked. Several buildings were evacuated, including the 88-year old Butte County Courthouse. There were visible cracks in its outside walls. An emergency room clerk at Oroville's only hospital said doctors treated five to 10 persons for minor injuries, mostly cuts caused by flying glass. A nurse said several more patients were treated for hysteria or suspected heart attacks."

The editor of the Oroville Mercury-Herald, Don Sheffer, said, "It's like nothing that ever hit here before, part of a bluff fell into the Feather River where it goes through town."

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

Firemen in Oroville reported 10 grass or brush fires, most caused by downed power lines, and two minor structure fires immediately after the main shock at 1:20 p.m.

The mayor of Oroville reported a "great tidal wave curling over the edge of the swimming pool."

The garden-shop manager at Montgomery Ward department store said he pulled a young boy out of the path of a huge air vent as it fell from the ceiling.

The Sacramento Bee of Saturday August 2 reported that an employee was walking across Oroville Dam when the big quake began; he said it caused a ripple on the lake surface but no damage to the embankment, although there was a brief power outage. The dam, which impounds more than 3 million acre-feet of water, is the keystone of the California Water Project. The State Department of Water Resources sent crews out to check levee systems and dams in the Central Valley. They reported no damage.

An employee at the California State University, Sacramento, library, who was in the stacks on the fourth floor, said, "There was a creaking and rippling sound among the books and I got out fast into the aisles. Our building is one of the most modern earthquake-safe structures in Sacramento, but it swayed a bit."

In another report, The Sacramento Bee stated: "Authorities in dozens of northern state cities, including Woodland, Susanville, Williams, Auburn, Placerville, and Pollock Pines, said they received calls indicating the quake had been felt there. However, there were no reports of major damage.

A woman in Fresno told deputies the larger shock knocked a lamp off a table in her home. A restaurant owner in Chico said several dishes broke when they tumbled off a table and several windows were reported shattered in Yuba City. In Biggs, the assistant police chief said a truss on the city water tower broke, windows shattered and canned goods spilled off their shelves in stores."

Listed below is an excerpt from a memo written by Dan N. Tidwell, Lowry and Associates, Sacramento, California, of his experience while working at the Mathews Ready Mix Plant, about 8 km southwest of Oroville:

"At approximately 1:20 p.m. [PDT], I had just sat down in my truck to have lunch. My first indication was a distant 'roar,' perhaps like the rumble

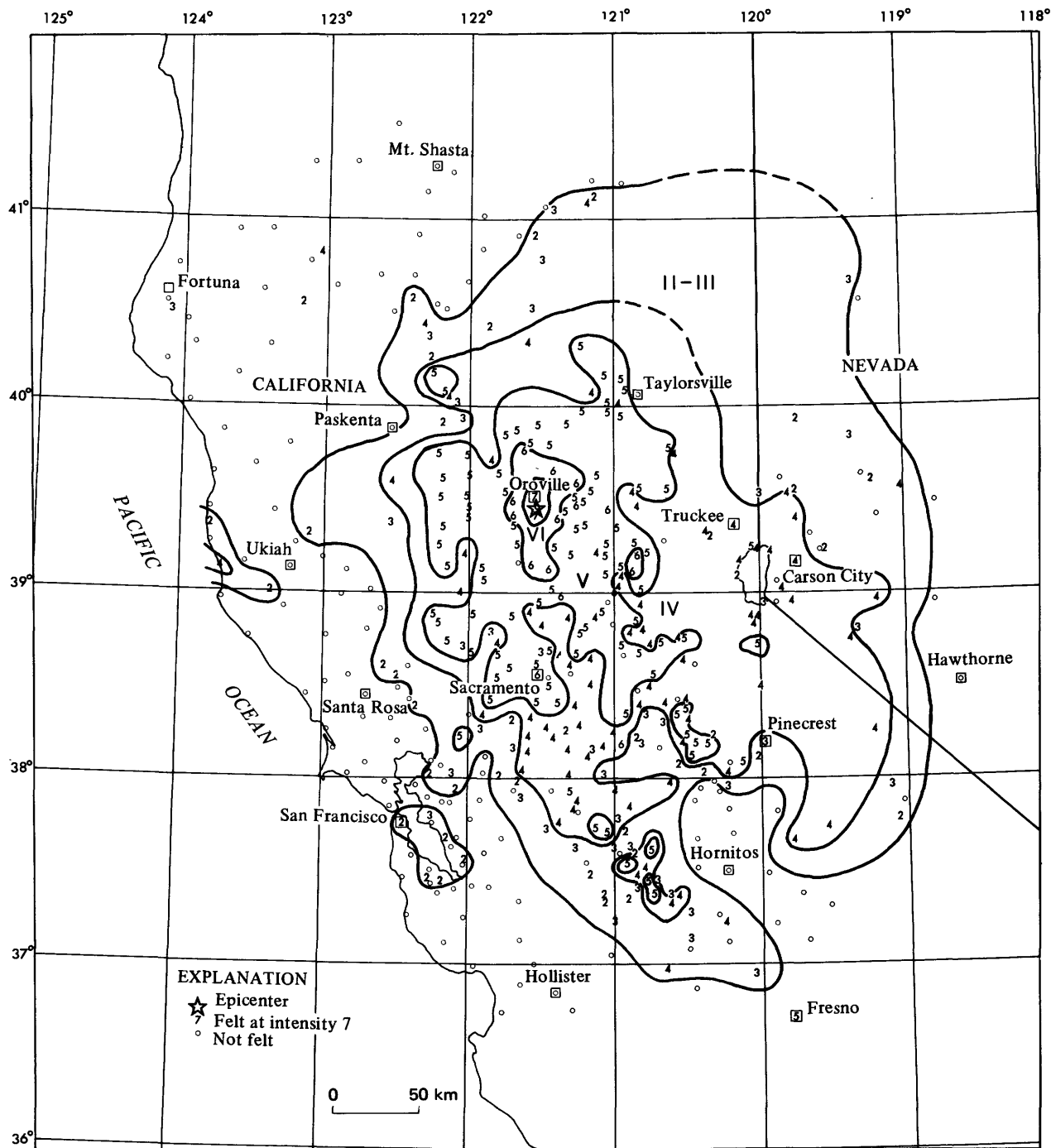


FIGURE 8.--Isoseismal map for the northern California earthquake of 1 August 1975, 20 20 12.9 UTC. Roman numerals represent modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

of a train. The shaking started within a few seconds and seemed to increase sharply after a few seconds of relatively minor movement. At this time, I made the decision to move away quickly from the plant. The door of the truck was open so I started running diagonally away from the plant. I ran approximately 50 yards and stopped and looked back at the plant. At this time, the major shaking was still going on and the entire earth and plant and auxiliary buildings appeared to be moving up and down ± 6 inches. The feeling was one of being on a giant rock crusher, very severe and very rapid, perhaps ten cycles per second. There was a lot of noise, both from the equipment shaking and the surrounding stockpiled materials settling and also a background roar of the quake itself. I would estimate the major motion lasted less than 30 seconds. In the minutes after the quake, I stayed in one place and could feel the earth 'quiver' as if resonating. The aftershocks were frequent, every five minutes more or less and were, for the most part, gentle bumps; however, at least one was severe enough to cause us to run out of the control room. Personally, I did not feel sick or dizzy at any time, although some of the drivers did. I think this is just an individual thing—I did not feel any 'fear' at any time; however, I think this is because I did not feel threatened—I was outside and had effectively planned what I was going to do and had a safe, clear area to run to. For someone closed up in a building, the feeling must be oppressive. They tell you to be calm. For a quake of this magnitude or greater, I don't think it is possible. The noise and movement compels you to want to move quickly—in any direction!"

Intensity IX: 5.1 km south of Lake Oroville (on the basis of surface faulting).

Intensity VII: Thermalito (many chimneys cracked, some fell; small landslides and small ground cracks occurred; plaster fell; windows were broken; many people were frightened), Oroville (small earth slides, small cracks in the ground; chimneys cracked; windows were broken. One report was of bent railroad rails--unverified).

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

Intensity VI: Alta, Bangor (tombstones cracked--unverified), Beale AFB, Berry Creek, Biggs, Brownsville (chimneys cracked--unverified), Camptonville, Feather Falls (power off for a few seconds), Marysville, Palermo (water disturbed), Paradise (cracks in main beam of outside dock), Richvale, Sacramento (cracked plaster), Sheridan (chimney cracked), Wallace (plaster cracked), Yuba City (press report).

Intensity V: Applegate, Arden, Artois, Auburn, Baxter, Belden, Big Trees, Blairsden, Broderick, Browns Valley, Bryte, Brooks (wave action on swimming pool), Butte City, Camino, Canyon Dam, Challenge, Chester, Chicago Park, Chico, Citrus Heights, Clarksburg, Clipper Mills, Clovis, Colfax, Crescent Mills, Davis, Delevan, Delhi, Dixon, Dobbins, Downieville, Dunnigan, Durham, Dutch Flat, Elk Grove, Elverta, Fairfield, Folsom, Forbestown, Foresthill, Forest Ranch, Fresno (press report), Garden Valley, Glencoe, Glenn, Gold Run, Grass Valley, Greenville, Gridley, Grimes, Guinda, Hamilton City, Hathaway Pines, Hickman, Ione, Iowa Hill, Keyes, Knights Landing, Lake Kirkwood, Live Oak, Livingston, Long Barn, Loomis, Madison, Magalia, Maxwell, Meadow Valley, Meridian, Mount Aukum, Mountain Ranch, Murphys, Nelson, Nevada City, North San Juan, Ordbend, Oregon House, Olivehurst, Orland, Pacific House, Paradise, Parkway, Princeton, Proberta, Pulga, Quincy, Rackerby, Red Bluff, Rescue, Richardson Springs, Rioosa, Ripon, Robbins, Rocklin, Rumsey, Salida, Sheep Ranch, Sierra City, Smartville, Stirling City, Stockton, Storrie, Strawberry Valley, Tahoe Vista, Trowbridge, Twain, Twin Bridges, Wheatland, Williams, Willows, Wilseyville, Woodland.

Intensity IV:

California--Acampo, Alleghany, Amador City, Anderson, Arbuckle, Atwater, Avery, Banta, Bethel Island, Blairsden, Bridgeport, Canyon Caribou, Carmichael, Castle AFB, Clemente, Clio, Colfax, College City, Coloma, Colusa, Copperopolis, Courtland, Crystal Bay, Denair, Diamond Springs, Dos Palos, Echo Lake, East Nicolaus, El Dorado, El Portal, Elk Creek, Elmira, Esparto, Fair Oaks, Fallen Leaf, Farmington, Fiddletown, Folsom, French Camp, Genova, Georgetown, Gerber, Goodyears

Table 2.—Summary of macroseismic data for U.S.
earthquakes, July–September 1975—Continued

California--Continued

Bar, Graeagle, Greenwood, Grizzly
Flats, Hazen, Herald, Hood, Isleton,
Keddie, Kelsey, Kings Beach, Lathrop,
Le Grand, Lincoln, Lincoln Village,
Lodi, Lotus, McClellan AFB, Meadow
Vista, Mineral, Newcastle, Nicolaus,
North Highlands, Nubieber, Orangevale,
Penryn, Pine Grove, Pioneer,
Placerville, Pleasant Grove, Pollock
Pines, Railroad Flat, Represa, River
Pines, Rough and Ready, Ryde,
Sloughhouse, Smithflat, Soda Springs,
Sutter Creek, Tahoe City, Tahoe
Paradise, Tehama, Thornton, Truckee,
Turlock, Twain Harte, Valley Home,
Victor, Volcano, Walnut Grove,
Waterford, Weed Heights, Weimar,
Wellington, West Point, West
Sacramento, Wilton, Winters, Yolo,
Yosemite National Park.

Nevada--Carson City, Minden, Reno,
Steamboat.

Intensity III:

California--Al Tahoe, Ballico, Byron,
Capay, Cottonwood, Cressey, El Nido,
Empire, Escalon, Gustine, Hat Creek,
Hilmar, Jackson, Lee Vining, Linden,
Lockeford, Los Molinos, Madera,
Manzanita Lake, Martinez, McArthur,
Merced, Modesto, Mokelumne Hill, Nixon,
Oakland, Pinecrest, Rio Dell, Rio
Linda, Rio Vista, Smith, Solano, South
Lake Tahoe, Stonyford, Tracy, Travis
AFB, Tuolumne, Vallecito, Valley
Springs, Verdi, Vernalis, Vina, Winton,
Zamora.

Nevada--Gerlach.

Intensity II:

California--Altaville, Angels Camp,
Antioch, Arnold, Auburn, Berkeley
(telephone report), Bieber, Booneville,
Calistoga, Campo Seco, Caspar, Cassel,
Columbia, Corning, Crows Landing,
Fremont, Galt, Gardnerville, Hayfork,
Homewood, Hughson, June Lake, Keddie,
Knightsen, Liberty Farms, Manton, Menlo
Park, Newman, Norden, Patterson, Paynes
Creek, Philo (press report), Pleasant
Hill, Potter Valley, Redding, Redwood
City, Riverbank, Rodeo, Sanitarium, San
Lorenzo, Stevinson, Strawberry,
Susanville, Tahoma, Veterans Home,
Woodbridge, Yountville.

Nevada--Dayton, Fernley, Sparks.

1 August (Z) Northern California

Origin time: 20 25
Epicenter: 39.44 N., 121.53 W.
Depth: None computed.
Magnitude: 4.7 ML(B)

Intensity III: Throughout Butte County
(B).

Table 2.—Summary of macroseismic data for U.S.
earthquakes, July–September 1975—Continued

California--Continued

1 August (Z) Northern California

Origin time: 20 29
Epicenter: 39.44 N., 121.53 W.
Depth: None computed.
Magnitude: 4.6 ML(B)

Intensity III: Throughout Butte County
(B).

1 August (B) Northern California

Origin time: 21 21 50.7
Epicenter: 39.44 N., 121.53 W.
Depth: 8 km
Magnitude: 5.3 mb, 4.1 ML

Intensity IV: Calaveras Big Trees State
Park, Oroville area (B).

2 August (P) Southern California

Origin time: 00 14 07.7
Epicenter: 33.52 N., 116.56 W.
Depth: 13 km
Magnitude: 4.6 mb(G), 4.7 ML

Intensity III: Leucadia.

Intensity II: Anza, Palm Springs, San
Diego.

2 August (B) Northern California

Origin time: 17 24 29.2
Epicenter: 39.47 N., 121.47 W.
Depth: 6 km
Magnitude: 4.6 mb(G), 4.3 ML

Intensity III: Throughout Butte County
(B).

2 August (B) Northern California

Origin time: 17 43 24.1
Epicenter: 39.48 N., 121.47 W.
Depth: 6 km
Magnitude: 3.9 mb(G), 4.0 ML

Intensity III: Throughout the Oroville
area (B).

2 August (B) Northern California

Origin time: 20 22 16.3
Epicenter: 39.45 N., 121.46 W.
Depth: 4 km
Magnitude: 5.3 mb(G), 4.5 MS(G), 5.1 ML

Intensity III: Throughout Butte and
surrounding counties (B).

2 August (G) Northern California

Origin time: 20 59 02.7
Epicenter: 39.41 N., 121.71 W.
Depth: 5 km
Magnitude: 5.2 mb, 4.7 MS, 5.1 ML(B)

Intensity VI: Oroville (B).

Intensity III: Throughout Butte and
surrounding counties.

Table 2.--Summary of macroseismic data for U.S. earthquakes, July-September 1975--Continued

California--Continued	
3 August (B) Northern California	
Origin time: 01 03 05.8	
Epicenter: 39.49 N., 121.52 W.	
Depth: 8 km	
Magnitude: 5.0 mb(G), 4.6 ML	
<u>Intensity III</u> : Throughout Butte County (B).	
3 August (B) Northern California	
Origin time: 02 47 08.8	
Epicenter: 39.48 N., 121.50 W.	
Depth: 7 km	
Magnitude: 4.5 mb(G), 3.3 MS(G), 4.1 ML	
<u>Intensity III</u> : Throughout the Oroville area (B).	
3 August (B) Central California	
Origin time: 05 57 17.3	
Epicenter: 36.47 N., 120.35 W.	
Depth: 4 km	
Magnitude: 4.6 mb(G), 4.0 ML	
<u>Intensity III</u> : Felt throughout Fresno County (B).	
3 August (B) Central California	
Origin time: 06 35 16.5	
Epicenter: 36.46 N., 120.35 W.	
Depth: 5 km	
Magnitude: 5.1 mb(G), 4.0 MS(G), 4.9 ML	
Felt over an area of approximately 18,000 sq km (fig. 9).	

Table 2.--Summary of macroseismic data for U.S. earthquakes, July-September 1975--Continued

California--Continued	
<u>Intensity VI</u> : Firebaugh (waterline broken and plaster cracked--unverified), Three Rocks (damage reported to a church)(B).	
<u>Intensity V</u> : Friant, Tranquillity.	
<u>Intensity IV</u> : Avenal, Camp Kaweah (Sequoia National Park), Coalinga, Corcoran, Dos Palos, Five Points, King City, Laton, Lemoncove, Huron, Kerman, Lemoore, Mariposa, Mendota, Oakhurst, Poplar, Raisin, San Joaquin.	
<u>Intensity III</u> : Armona, Biola, Calwa, Cutler, Denair, El Nido, Hollister, Hume, Madera, Porterville, Riverdale, Selma, Stratford, Traver.	
<u>Intensity II</u> : Livingston, Stevenson, Terra Bella, Tollhouse, and throughout Fresno County (B).	
3 August (B) Central California	
Origin time: 06 37 52.0	
Epicenter: 36.47 N., 120.35 W.	
Depth: 5 km	
Magnitude: 4.1 mb(G), 4.4 ML	
<u>Intensity II</u> : South of Fresno.	
6 August (B) Northern California	
Origin time: 03 50 29.9	
Epicenter: 39.48 N., 121.52 W.	
Depth: 7 km	
Magnitude: 5.1 mb(G), 4.0 MS(G), 4.7 ML	

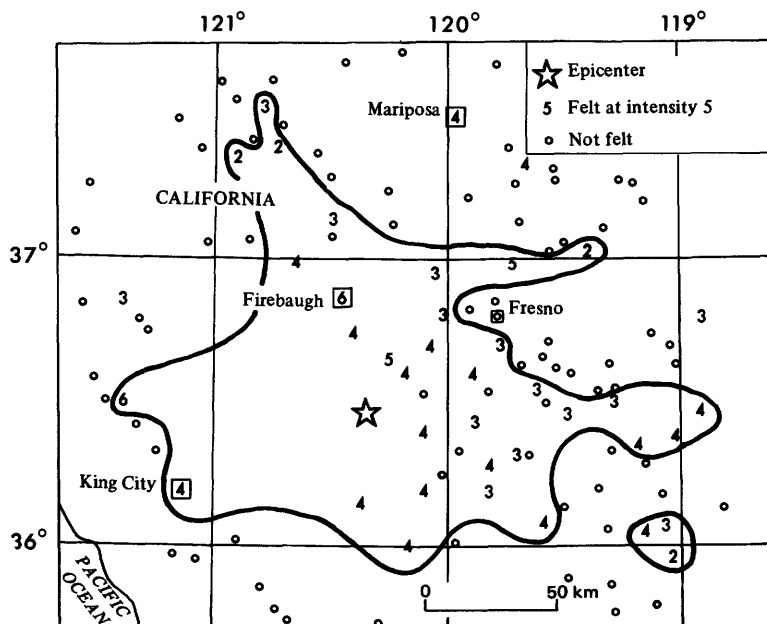


FIGURE 9.--Intensity map for the central California earthquake of 3 August 1975, 06 35 16.5 UTC, with the contiguous felt area contoured. Arabic numbers are used to represent modified Mercalli intensities at specific sites.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued	
A canvass was not done on this earthquake, which was widely felt. Information listed is as received from seismic observers in the mentioned area.	
<u>Intensity V</u> : Hamilton City.	
<u>Intensity IV</u> : Grass Valley, La Porte.	
<u>Intensity II</u> : Fair Oaks. Felt throughout Butte County (B).	
8 August (B) Northern California	
Origin time: 07 00 50.1	
Epicenter: 39.50 N., 121.51 W.	
Depth: 8 km	
Magnitude: 5.0 mb(G), 4.9 ML	
<u>Intensity IV</u> : Grass Valley.	
<u>Intensity III</u> : Foresthill.	
<u>Intensity II</u> : Throughout Butte County (B).	
10 August (B) Central California	
Origin time: 05 16 40.5	
Epicenter: 37.37 N., 119.98 W.	
Depth: 7 km	
Magnitude: 4.0 mb(G), 3.8 ML	
<u>Intensity VI</u> : San Joaquin.	
<u>Intensity V</u> : Ahwahnee, Atwater, Big Creek, Coulterville, El Portal, Fig Garden Village, Fresno, Friant, Hornitos, Lakeshore, Le Grand, Madera, Mariposa, Merced, Oakhurst, O'Neals, Raisin, Raymond, Red Top, Sequoia National Park, Shaver Lake, Strawberry, Twain Harte, Wishon.	
<u>Intensity IV</u> : Auberry, Avery, Bass Lake, Big Oak Flat, Biola, Chowchilla, Coarsegold, Del Rey, Dos Palos, Fish Camp, Fowler, Hathaway Pines, Long Barn, Murphys, North Fork, Pinedale, Prather, Snelling, Tranquillity, Tuolumne, Yosemite National Park.	
<u>Intensity III</u> : Clovis, Cressey, El Nido, Hilmar, Huntington Lake, June Lake, Pinecrest.	
<u>Intensity II</u> : Kerman, Moccasin, Soulsbyville, South Dos Palos, Winton.	
11 August (B) Northern California	
Origin time: 06 11 36.3	
Epicenter: 39.45 N., 121.48 W.	
Depth: 4 km	
Magnitude: 4.8 mb(G), 3.8 MS(G), 4.3 ML	
<u>Intensity VI</u> : Madison (asphalt pavement cracked--unverified).	
<u>Intensity V</u> : Arbuckle, Brownsville, Chico, Esparto, Forest Ranch, Gridley, Live Oak, Oregon House, Palermo, Smartville.	
<u>Intensity IV</u> : Alleghany, Alta, Beale AFB, Browns Valley, Camptonville, Chicago Park, College City, Dobbins, Durham, Feather Falls, Forbestown, Gold Run,	

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued	
Grass Valley (press report), Grimes, Herald, Marysville, Nevada City, North San Juan, Placerville, Rackerby, Richvale, Robbins, Strawberry Valley.	
<u>Intensity III</u> : Bangor, Guinda, Knights Landing, Meridian, Richardson Springs, Storrie, Thornton, Willows.	
<u>Intensity II</u> : Challenge, Hood, Nicolaus, West Sacramento, Wheatland, Wilton.	
14 August (P) Southern California	
Origin time: 08 08 49.8	
Epicenter: 34.02 N., 116.43 W.	
Depth: 11 km	
Magnitude: 4.2 mb(G), 4.0 ML	
<u>Intensity V</u> : North Palm Springs.	
<u>Intensity IV</u> : Desert Hot Springs, Indian Wells, Morongo Valley, Rancho Mirage, Yucca Valley.	
<u>Intensity II</u> : Cathedral City.	
14 August (P) Southern California	
Origin time: 08 10 36.7	
Epicenter: 34.03 N., 116.44 W.	
Depth: 10 km	
Magnitude: 3.8 ML	
<u>Intensity III</u> : Cathedral City, Desert Hot Springs, Rancho Mirage.	
15 August (B) Central California	
Origin time: 22 27 51.8	
Epicenter: 36.49 N., 120.39 W.	
Depth: 6 km	
Magnitude: 4.5 mb(G), 4.5 ML	
<u>Intensity III</u> : Throughout Fresno County.	
16 August (B) Northern California	
Origin time: 05 48 09.4	
Epicenter: 39.47 N., 121.52 W.	
Depth: 9 km	
Magnitude: 4.3 mb(G), 4.0 ML	
<u>Intensity III</u> : Throughout the Oroville area (B).	
17 August (G) California–Nevada border region	
Origin time: 00 24 26.0	
Epicenter: 37.61 N., 118.81 W.	
Depth: 5 km	
Magnitude: 4.0 ML(B), 4.1 ML(P)	
<u>Intensity II</u> : Bishop area.	
29 August (B) Central California	
Origin time: 07 52 42.6	
Epicenter: 36.51 N., 120.39 W.	
Depth: 5 km	
Magnitude: 4.0 mb(G), 3.8 ML	
<u>Intensity V</u> : Cantua Creek (awakened and frightened many in the community).	
10 September Northern California	
Origin time: 10 39	
Depth: None computed.	
Magnitude: 3.5 ML(B)	
<u>Intensity II</u> : Oroville area (B).	

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

10 September Northern California
Origin time: 12 38
Epicenter: Not located.
Depth: None computed.
Magnitude: 3.0 ML(B)
Intensity II: Oroville area (B).

10 September (Z) Northern California
Origin time: 17 39 05.2
Epicenter: 39.52 N., 121.54 W.
Depth: 1 km
Magnitude: 3.4 ML(B)
Intensity II: Oroville area (B).

13 September (B) Central California
Origin time: 21 20 59.8
Epicenter: 36.00 N., 120.56 W.
Depth: 13 km
Magnitude: 4.9 mb(G), 4.3 MS(G), 4.8 ML

Felt over an area of approximately 16,000 sq km (fig. 10).

Intensity VI: Avenal (cracked plaster; ground cracked; furniture shifted).

Intensity V: Bradley, Creston, San Ardo, San Miguel, Templeton.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued

Intensity IV: Avila Beach, Cayucos, Cholame, Coalinga, Jolon, King City, Lemoore Naval Air Station, Oceano, Paso Robles, San Luis Obispo, Santa Margarita, Shandon.

Intensity III: Armona, Atascadero, Caliente, Cambria, Lemoore, Morro Bay, Porterville.

Intensity II: Carmel Valley, Delano, Greenfield, Hilmar, Hughson, Kettleman City, Lockwood, Parlier, Riverdale, Seaside, San Joaquin.

15 September (G) Central California
Origin time: 12 31 16.4
Epicenter: 37.81 N., 121.97 W.
Depth: 10 km
Magnitude: 2.8 ML(B)
Intensity IV: Diablo.
Intensity III: Alamo, Danville.
Intensity II: Walnut Hills.

26 September (B) Northern California
Origin time: 02 31 07.1
Epicenter: 39.50 N., 121.50 W.
Depth: 11 km
Magnitude: 4.1 mb(G), 4.0 ML
Intensity II: Grass Valley, Nevada City, Oroville.

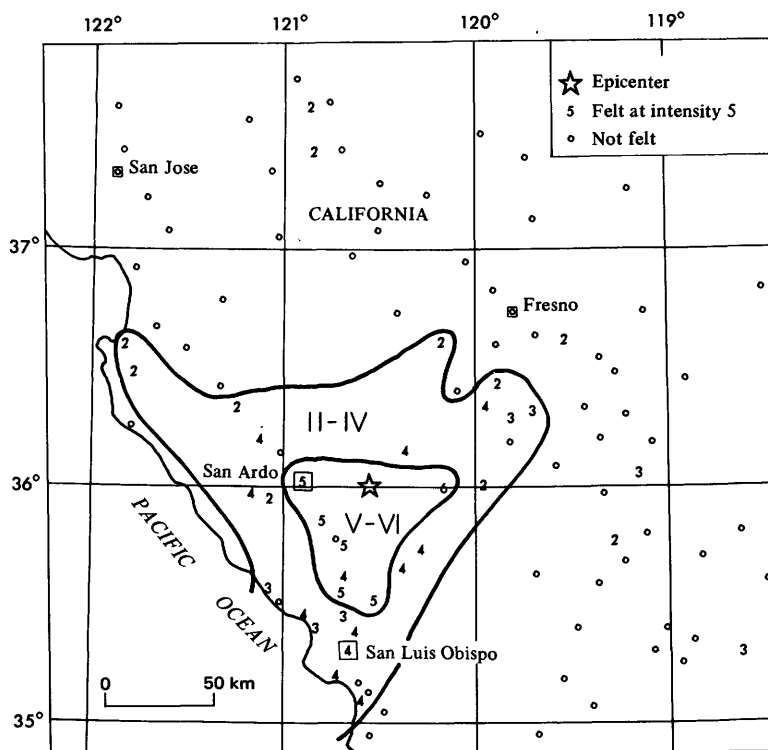


FIGURE 10.—Isoseismal map for the central California earthquake of 13 September 1975, 21 20 59.8 UTC. Roman numerals represent modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

California--Continued	
26 September (G) Northern California	
Origin time: 09 57 15.2	
Epicenter: 39.44 N., 121.61 W.	
Depth: 10 km	
Magnitude: 2.9 ML(B)	
<u>Intensity IV</u> : Strawberry Valley region.	
<u>Intensity III</u> : Oroville.	
27 September (B) Northern California	
Origin time: 22 34 38.1	
Epicenter: 39.51 N., 121.54 W.	
Depth: 8 km	
Magnitude: 5.3 mb(G), 3.5 MS(G), 4.6 ML	
<u>Intensity IV</u> : Throughout the Butte County area(B), Grass Valley, Pacific House, Strawberry Valley.	
<u>Intensity III</u> : Blairsden (Plumas Eureka State Park), Foresthill.	

California--Off the coast

9 September (G) Northern California	
Origin time: 02 43 42.5	
Epicenter: 40.92 N., 124.40 W.	
Depth: 27 km	
Magnitude: 4.9 mb, 4.6 ML(B)	
<u>Intensity IV</u> : Ferndale.	
<u>Intensity III</u> : Bayside, Eureka, Orick, Rio Dell, Trinidad.	
<u>Intensity II</u> : Arcata, Fortuna, Loleta.	

Hawaii

5 July (H) Hawaii Island	
Origin time: 03 40 55.1	
Epicenter: 19.35 N., 155.32 W.	
Depth: 28 km	
Magnitude: 4.2 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo District, Kona District, Puna District.	
6 July (H) Hawaii Island	
Origin time: 09 18 18.3	
Epicenter: 19.45 N., 155.60 W.	
Depth: 1 km	
Magnitude: 4.3 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo, Kona District, Pahala, Volcano.	
6 July (H) Hawaii Island	
Origin time: 09 25 45.9	
Epicenter: 19.43 N., 155.64 W.	
Depth: 4 km	
Magnitude: 4.4 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo, Kona District, Pahala, Volcano.	

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Hawaii--Continued	
7 July (H) Hawaii Island	
Origin time: 15 39 48.6	
Epicenter: 19.51 N., 155.45 W.	
Depth: 7 km	
Magnitude: 3.6 ML	
<u>Intensity III</u> : Kau District, Volcano.	
8 July (H) Hawaii Island	
Origin time: 00 47 41.9	
Epicenter: 19.51 N., 155.48 W.	
Depth: 1 km	
Magnitude: 3.9 mb(G), 4.3 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Southern parts of Hawaii Island.	
8 July (H) Hawaii Island	
Origin time: 04 39 52.2	
Epicenter: 19.51 N., 155.45 W.	
Depth: 7 km	
Magnitude: 4.3 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo, Kona District, Pahala, Volcano.	
8 July (H) Hawaii Island	
Origin time: 11 09 07.5	
Epicenter: 19.52 N., 155.47 W.	
Depth: 7 km	
Magnitude: 3.9 ML	
<u>Intensity III</u> : Pahala.	
9 July (H) Hawaii Island	
Origin time: 06 07 02.6	
Epicenter: 19.51 N., 155.46 W.	
Depth: 7 km	
Magnitude: 4.1 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo, Kona District, Pahala, Volcano.	
9 July (H) Hawaii Island	
Origin time: 15 47 42.7	
Epicenter: 19.52 N., 155.46 W.	
Depth: 7 km	
Magnitude: 4.3 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Hilo, Kona District, Pahala, Volcano.	
9 July (H) Hawaii Island	
Origin time: 18 40 03.4	
Epicenter: 19.51 N., 155.47 W.	
Depth: 7 km	
Magnitude: 4.5 ML	
<u>Intensity IV</u> : Kau District.	
<u>Intensity III</u> : Islandwide.	

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Hawaii--Continued	
19 July (H)	Hawaii Island
Origin time:	07 19 58.1
Epicenter:	19.24 N., 155.01 W.
Depth:	8 km
Magnitude:	3.4 ML
<u>Intensity III:</u>	Hilo.
23 July (H)	Hawaii Island
Origin time:	01 12 32.7
Epicenter:	19.78 N., 156.20 W.
Depth:	41 km
Magnitude:	4.4 ML
<u>Intensity III:</u>	Kona District.
30 July (H)	Hawaii Island
Origin time:	23 31 22.4
Epicenter:	19.52 N., 155.60 W.
Depth:	11 km
Magnitude:	3.9 ML
<u>Intensity III:</u>	Pahala, South Kona District.
5 August (H)	Hawaii Island
Origin time:	17 36 38.6
Epicenter:	19.25 N., 155.39 W.
Depth:	1 km
Magnitude:	3.3 ML
<u>Intensity III:</u>	Kau District.
<u>Intensity II:</u>	Kapapala Ranch, Pahala.
18 August (H)	Hawaii Island
Origin time:	17 08 55.9
Epicenter:	19.62 N., 156.09 W.
Depth:	49 km
Magnitude:	3.9 ML
<u>Intensity III:</u>	Kona District.
24 August (H)	Hawaii Island
Origin time:	15 45 35.4
Epicenter:	19.35 N., 155.28 W.
Depth:	33 km
Magnitude:	3.6 ML
<u>Intensity III:</u>	Volcano.
27 August (H)	Hawaii Island
Origin time:	17 34 44.2
Epicenter:	19.44 N., 155.47 W.
Depth:	8 km
Magnitude:	4.1 ML
<u>Intensity IV:</u>	Kau District.
<u>Intensity III:</u>	Keaau, Pahoa, South Kona District, Volcano.
10 September (H)	Hawaii Island
Origin time:	18 34 11.0
Epicenter:	19.35 N., 155.19 W.
Depth:	2 km
Magnitude:	3.5 ML
<u>Intensity III:</u>	Hilo, Volcano.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Hawaii--Continued	
22 September (H)	Hawaii Island
Origin time:	05 46 01.5
Epicenter:	19.33 N., 155.21 W.
Depth:	7 km
Magnitude:	3.2 ML
<u>Intensity III:</u>	Hilo, Kurtistown.
Idaho	
12 September (U)	Southern Idaho
Origin time:	18 26 06.4
Epicenter:	42.07 N., 112.57 W.
Depth:	5 km
Magnitude:	4.0 ML
<u>Intensity III:</u>	Utah--Portage, Riverside (telephone reports).
<u>Intensity II:</u>	Idaho--Holbrook.
22 September (U)	Southern Idaho
Origin time:	10 42 36.2
Epicenter:	42.07 N., 112.45 W.
Depth:	3 km
Magnitude:	4.2 mb(G), 3.6 ML
<u>Intensity IV:</u>	Idaho--Holbrook.
	Utah--Portage.
Massachusetts	
3 August (J)	Northeastern Massachusetts
Origin time:	01 03 22.0
Epicenter:	42.67 N., 70.85 W.
Depth:	5 km
Magnitude:	2.4 mblg
<u>Intensity III:</u>	Newburyport, West Newbury.
<u>Intensity II:</u>	Andover, Essex, Ipswich, North Andover.
Minnesota	
9 July (G)	Western Minnesota
Origin time:	14 54 15.1
Epicenter:	45.67 N., 96.04 W.
Depth:	10 km
Magnitude:	5.0 mb, 4.8 mblg(S)
No major damage was caused by this earthquake, which had a maximum intensity of VI and was felt over an area of 82,000 sq km (fig. 11) of western Minnesota, southeastern North Dakota, northeastern South Dakota, and northwestern Iowa.	
<u>Intensity VI:</u>	Minnesota--Alberta (inside foundation damage--KMRS radio), Chokio (chimney damage, cracks in basement--KMRS), Glenwood (four basements cracked), Kent (basements cracked), Morris

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Minnesota--Continued

(cracks in north wall of church, cracks in basement walls--KMRS), Wheaton (a few reports of basements and foundations cracking).

Intensity V:

Minnesota--Albany, Appleton, Barnesville, Barrett, Barry, Beardsley, Benson, Brandon, Brooten, Browns Valley, Campbell, Canby, Clara City, Clinton, Clontarf, Collegeville, Cottonwood, Cyrus, Danvers, Dawson, De Graff, Donnelly, Dumont, Elbow Lake, Fergus Falls, Graceville, Grey Eagle, Hancock,

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Minnesota--Continued

Herman, Hoffman, Holdingford, Holloway, Holmes City, Johnson, Little Falls, Louisburg, Madison, Maynard, Milan, Montevideo, Murdock (well water muddied), Nassau, Nelson, Norcross, Odessa, Ortonville, Paynesville, Perham, Rothsay, Sartell, Tenney, Tintah, Upsala, Watson.

North Dakota--Abercrombie, Cayuga, Christine, Cogswell, Geneseo, Hankinson, Lidgerwood, Mantador.

South Dakota--Big Stone City, Bryant, Claire City, Corona, Langford,

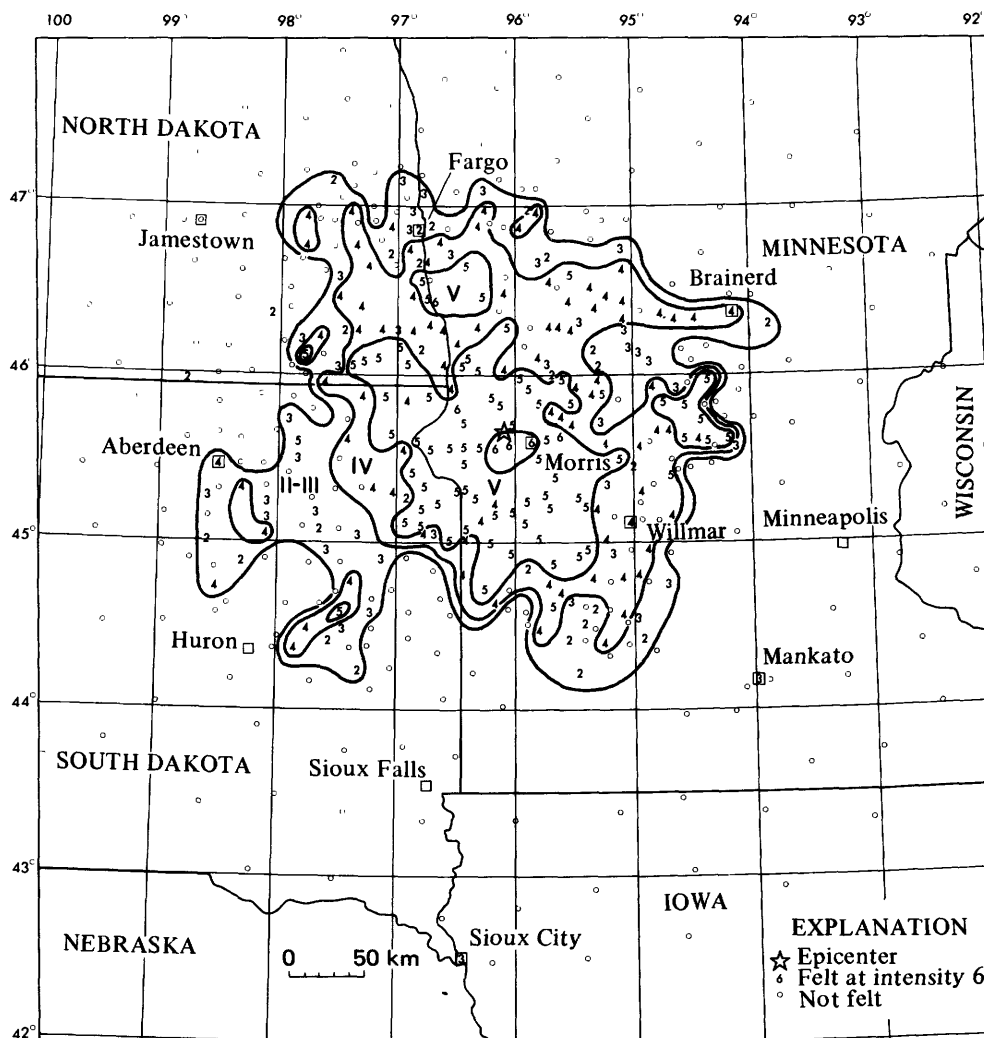


FIGURE 11.—Isoseismal map for the western Minnesota earthquake of 9 July 1975, 14 54 15.1 UTC. Roman numerals represent modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Minnesota--Continued

Milbank, Revillo, Rosholt, Sisseton,
South Shore, Stockholm, Twin Brooks,
Wilmot.

Intensity IV:

Minnesota--Alexandria, Ashby, Audubon,
Avon, Battle Lake, Bellingham,
Bluffton, Brainerd, Carlus,
Clitherall, Comstock, Correll,
Danube, Deer Creek, Dent, Doran,
Elrosa, Erhard, Farwell, Foxhome,
Freeport, Garfield, Grove City,
Hanley Falls, Hawley, Hazel Run,
Henning, Hewitt, Kensington,
Kerkhoven, Lake Lillian, Litchfield,
Long Prairie, Lowry, Madison,
Marietta, Marshall, Melrose, Motley,
New London, New Munich, New York
Mills, North Redwood, Olivia,
Ottertail, Pillager, Porter, Raymond,
Richwood, Sabin, Sacred Heart,
Sebeka, Sedan, Staples, Starbuck,
Vining, Wabasso, Wadena, Wendell,
Willmar.

North Dakota--Absaraka, Chaffee,
Colfax, De Lamere, Dwight, Fairmount,
Fingal, Gwinner, Havana, Horace,
Lisbon, Leonard, Mapleton, McLeod,
Mooreton, Oriska, Wahpeton, Wyndmere.

South Dakota--Aberdeen, Bancroft, Eden,
Gary, Hazel, Iroquois, New Effington,
Ortley, Peever, Strandburg,
Stratford, Summit, Tulare, Turton,
Veblen, White Rock.

Intensity III:

Iowa--Sioux City (felt strongly by many
on upper floors of tall buildings).

Minnesota--Baker, Barrett, Bertha,
Browerville, Eagle Bend, Georgetown,
Hector, Hitterdal, Mankato, Melby,
Menahga, Minneapolis, Moorhead,
Morton, Prinsburg, St. Cloud,
Sunburg, Svea, Swanville, Ulen,
Vergas, Villard, Wood Lake.

North Dakota--Barney, Gardner, Harwood,
Rutland, Sheldon, Stirum, West Fargo.

South Dakota--Albee, Amherst, Conde,
Elkpoint, Erwin, Florence, Garden
City, La Bolt, Lake Norden, Lily,
Mansfield, Pier Point, Verdon,
Watertown.

Intensity II:

Minnesota--Battle Lake, Belgrade,
Belview, Boyd, Callaway, Clarissa,
Detroit Lakes, Dilworth, Evansville,
Frazee, Garrison, Greenbush, Little
Sauk, Milroy, Miltona, Morgan,
Parkers Prairie, St. Paul, Vesta,
Walnut Grove.

North Dakota--Davenport, Fargo (press
report), Forbes, Great Bend, Hickson,
Milnor, Page, Valley City, Verona.

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

Minnesota--Continued

South Dakota--Aberdeen, Athol, Bradley,
Davis, De Smet, Frankfort, Marvin,
Millbank (press report), Oldham,
Sioux Falls.

Mississippi

9 September (G) Southern Mississippi

Origin time: 11 52 44.1
Epicenter: 30.66 N., 89.25 W.
Depth: 5 km
Magnitude: 2.9 mbLg(T)

Intensity IV: Perlington (boxcars shook
in railroad yard where 20 people who
were working felt the quake--telephone
report from fireman of railroad yard).

Intensity II: Bay St. Louis (National
Weather Service).

Montana

18 July (G) Western Montana

Origin time: 15 06 22.5
Epicenter: 46.72 N., 112.12 W.
Depth: 5 km
Magnitude: 3.9 ML

Intensity IV: Big Arm, Fort Harrison,
Helena, Marysville.

Intensity III: Clancy, Rollins.

Intensity II: Austin, Galata, Great Falls
(press report), Jeffers, Missoula
(press report).

18 July (G) Western Montana

Origin time: 18 39 02.6
Epicenter: 46.69 N., 112.13 W.
Depth: 5 km
Magnitude: 3.1 ML
Intensity II: Helena area.

19 July (G) Western Montana

Origin time: 12 00 22.8
Epicenter: 46.69 N., 112.10 W.
Depth: 5 km
Magnitude: 3.5 ML
Intensity II: Helena area.

Nevada

6 September (A) Southern Nevada

Origin time: 17 00 00.1
Epicenter: 37.02 N., 116.03 W.
Depth: 0 km
Magnitude: 4.6 mb(G), 4.3 ML(B)
Nevada Test Site explosion at 37°01'
25.13"N., 116°01'44.91"W.

Table 2.—Summary of macroseismic data for U.S.
earthquakes, July–September 1975—Continued

New York	
19 July (L)	Southeastern New York
Origin time:	20 59 32.2
Epicenter:	41.43 N., 73.79 W.
Depth:	3 km
Magnitude:	2.3 mbLg
<u>Intensity III:</u>	Mahopac, Scotia (L).
<u>Intensity II:</u>	Putnam Valley area.
Oklahoma	
12 September (G)	Southern Oklahoma
Origin time:	01 25 02.8
Epicenter:	34.14 N., 97.37 W.
Depth:	5 km
Magnitude:	3.4 ML(T)
<u>Intensity IV:</u>	Wilson.
Tennessee	
6 July (S)	Western Tennessee
Origin time:	08 48 13.9
Epicenter:	36.19 N., 89.49 W.
Depth:	5 km
Magnitude:	2.9 mbLg
<u>Intensity II:</u>	Miston.
Texas	
1 August (G)	Southwestern Texas
Origin time:	07 27 57.3
Epicenter:	31.42 N., 104.01 W.
Depth:	5 km
Magnitude:	3.0 mbLg(T)
<u>Intensity II:</u>	Valentine.
Utah	
10 September (G)	Southwestern Utah
Origin time:	06 39 42.5
Epicenter:	38.48 N., 112.56 W.
Depth:	5 km
Magnitude:	3.3 ML(U)
<u>Intensity II:</u>	Beaver, Covefort, Sulphurdale.
14 September (G)	Northern Utah
Origin time:	04 13 24.2
Epicenter:	41.87 N., 112.43 W.
Depth:	5 km
Magnitude:	None computed.
<u>Intensity III:</u>	Utah--Portage, Riverside.
<u>Intensity II:</u>	Idaho--Holbrook.

Table 2.—Summary of macroseismic data for U.S.
earthquakes, July–September 1975—Continued

Washington	
14 July (W)	Puget Sound region
Origin time:	05 50 34.6
Epicenter:	47.32 N., 122.41 W.
Depth:	7 km
Magnitude:	3.0 ML(G)
<u>Intensity V:</u>	Docton, Milton.
<u>Intensity IV:</u>	Tacoma, Vashon.
<u>Intensity III:</u>	Auburn, Lakewood Center, Port Orchard, South Prairie, Sumner, White Center.
<u>Intensity II:</u>	Anderson Island, Brinnon, Gig Harbor, Grapeview, Roosevelt, Seabeck, Seattle (press report).
24 July (W)	Puget Sound region
Origin time:	11 42 11.8
Epicenter:	47.32 N., 122.41 W.
Depth:	6 km
Magnitude:	3.4 ML(G)
<u>Intensity V:</u>	Milton, Puyallup, Redondo.
<u>Intensity IV:</u>	Algona, Auburn, Burley, Docton, Gig Harbor, Lakewood Center, Manchester, Pacific, Port Orchard, Seattle, Wilkeson.
Wyoming	
All Yellowstone National Park felt information was supplied by R. A. Hutchinson (written commun., 1976).	
1 July (G)	Yellowstone National Park
Origin time:	04 16 22.5
Epicenter:	44.79 N., 110.74 W.
Depth:	5 km
Magnitude:	4.4 ML
<u>Intensity II:</u>	Mammoth Hot Springs, Norris, Tower Junction.
1 July (G)	Yellowstone National Park
Origin time:	15 57 47.8
Epicenter:	44.79 N., 110.74 W.
Depth:	5 km
Magnitude:	3.4 ML
<u>Intensity II:</u>	Norris.
2 July (G)	Yellowstone National Park
Origin time:	08 29 29.6
Epicenter:	44.79 N., 110.76 W.
Depth:	5 km
Magnitude:	4.6 mb, 3.3 ML
<u>Intensity II:</u>	Norris.
5 July (G)	Yellowstone National Park
Origin time:	19 17 39.0
Epicenter:	44.71 N., 110.62 W.
Depth:	5 km
Magnitude:	4.5 mb, 4.3 ML

Table 2.—Summary of macroseismic data for U.S. earthquakes, July–September 1975—Continued

	<u>Intensity IV</u> : Felt by all vacationers staying at Yellowstone Village Cabins.
	<u>Intensity III</u> : Canyon Village (felt for 5 seconds at Canyon, indoors).
5 July (G)	Yellowstone National Park
	Origin time: 20 08 29.7
	Epicenter: 44.76 N., 110.64 W.
	Depth: 5 km
	Magnitude: 3.5 mb, 3.5 ML
	<u>Intensity III</u> : Norris.
7 July (G)	Yellowstone National Park
	Origin time: 00 51 27.9
	Epicenter: 44.76 N., 110.57 W.
	Depth: 5 km
	Magnitude: 4.3 mb, 3.6 ML
	<u>Intensity II</u> : Canyon, Norris.
11 July (G)	Southeastern Wyoming
	Origin time: 16 39 22.1
	Epicenter: 41.97 N., 106.73 W.
	Depth: 5 km
	Magnitude: None computed.
	<u>Intensity II</u> : Rawlins.
13 July (G)	Yellowstone National Park
	Origin time: 10 01 07.2
	Epicenter: 44.70 N., 110.67 W.
	Depth: 5 km
	Magnitude: 4.4 mb, 3.8 ML
	<u>Intensity IV</u> : Canyon—awoke many people in cabins; some aftershocks.

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